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JAMES B. HODGKIN, D. D. S.

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ARTICLE I.

New Methods of Mounting Artificial Teeth.—(Continued.)

[Transactions of Ohio State Dental Society.]

Dr. J. Taft.—There is another point in reference to artificial plates, to which I think too little attention is given, and that is, the adjusting of plates bearing a few teeth—partial sets of teeth—adjusting them round about the natural teeth in such a way as to afford them the greatest security from injury. I think every one of much experience will have recognized the fact that in a great majority of cases where partial sets of teeth are worn, the gums around the natural teeth, that may be standing, are more or less diseased. The margins of the gum may be irritated in two or three ways. If the plate brought up around about the tooth, is made to impinge upon it, it will invariably produce disease of that gum. Sometimes there is simply irritation; in some cases inflammation; in others hypertrophy—enlargement of the gums; some fit the plate up very close to the adjoining teeth; others are not careful about this, letting it come in contact or not; and some leave it some distance away, as it may happen, without any special design. Some again are careful to get the plate away a considerable distance from the margins of the gums, so this influence shall not be exerted upon them. I have considered it a matter of importance that the margins of the gums about such teeth should receive special attention and be properly guarded. Now the point is to properly guard the gum. If it is diseased, or if it is simply irritated, its product is vitiated and will sooner or later become injurious to the teeth and cause them to decay. We see a great many teeth decay in the vicinity of plates from these two causes, the vicious product arising from irritation at the margin of the gum and from the lodgment and decomposition of foreign substances. Now, what is the best way to arrange plates around the teeth, so as to best secure the gums and teeth, so as to avoid irritating the gums, and to prevent the lodgment of foreign material? Gentlemen who are working in laboratories and working with partial sets of teeth have their opinion. But what can we do to protect the teeth from the lodgment of foreign substances and the irritation of the gums? Of course different cases will be differently affected. Some are so susceptible to the presence of foreign substances that any one almost will produce more or less irritation. Others again—and quite a majority, perhaps, bear a plate very well without showing any signs of irritation, especially if the plate is of proper material.

DR. A. BERRY.—I think these questions of Dr. Taft's are very pertinent and very important, and pertain to matters of great consequence to persons wearing artificial teeth. This matter of artificial plates has for the last few years, by a great many of the best operators in our profession, been entirely too much ignored. There are a great many men who are splendid operators in the way of filling teeth, but when it comes to the matter of plates their consciences are not clear. That part of the practice is too much neglected by the profession. I know there is not the money in mechanical dentistry that there is in operative, and not so much honor; but that does not exhonerate us from doing the best we can for those who wear artificial teeth.

Now in reference to this matter of plates impinging on the gums, and the lodgment of foreign matter about the natural teeth, much may be said. The plates may be brought closely up to the natural teeth when the parts are all healthy, and upon fitting them closely you may think it is all right and nice, but if you make a nice adaptation to the necks of teeth where there is already diseased action, or a tendency to it, as may be determined in most cases by close inspection, you invariably cause diseased action to follow. In many cases when plates are made to fit closely and nicely—and we used to do so to a greater extent when we made gold plates than now—they produced disease and disorder, leading patients to complain, and often a little must be cut away to give relief. A great deal of discrimination is necessary to know what to do in the outset without waiting for consequences. More attention and study should be given to this subject. The health and comfort of the patient depends very much on these matters, over which the dentist has control; and he should see to it that the most perfect plates of the best manufacture, are so skillfully set and arranged as to give the most comfort and satisfaction to the wearer.

Dr. F. H. Rehwinkel.—There is one point in this matter to which I wish to refer; that is, that the material in some cases has something to do with it, and on that ground, I endeavor as much as possible to have persons use nothing but gold for partial sets of teeth. I exhaust every argument I can use on the subject, before consenting to insert rubber for partial sets.

Now I have never been able to determine—because I have not made experiments with it systematically—whether one method is better than another, and whether we should let the plate go close to the margin of the gum on the lingual surface of the teeth, as Dr. Berry said, must be determined by the condition of the mucous membrane of the mouth. If, for instance, there is a flabby condition the gums, which inclines to inflammation, I apprehend a plate were in that case fitted closely to the gums, you would have trouble, unless you take the precaution to impress upon the patient as strongly as you can, never to wear any kind of plates at night. I know a great many dentists differ with me in this matter; but I know it is one of the greatest things to avert disease in some mouths. Those who have worn artificial teeth themselves and have not observed that caution may have become used to it. But if you consider for a moment that for the space of from twelve to eighteen hours—say fourteen hours—you have a strange substance in the mouth, over the mucous membrane, interfering with the circulation, you must be convinced that unless you can give those parts time to rest, and allow the capillaries to become filled again, and the natural channels of circulation to be restored, you will have trouble.

This is one of the points I insist upon; and always advise removal of the plates at night. I have seen cases where this condition of disease existed in the mouth, and upon asking the patient if the plates were not worn at night, found this to be the case; when upon following my advice, to discontinue doing so, the trouble which existed has been very much alleviated, if not entirely removed,

It is now my turn to ask questions. I would ask Dr. Taft what has become of the method called "Hall's method." You will remember that the subject was introduced some years since, and it was claimed that it was done by cutting dovetailed grooves in the teeth. I have heard nothing of it lately. I believe they were promised as soon as he could make arrangements with Dr. S. S. White for the purpose of getting up some patterns.

Dr. Taft.—There were some good features about them; some principles which, if carried out, would be very good. He had some difficulty in getting the teeth made, and I presume that was the chief embarassment about it. White, and indeed all the manufacturers, have expended large amounts of money and labor in molds, etc., for the manufacture of teeth, and might not have felt like venturing into an enterprise calling for a large outlay in addition to that already incurred, as it would have required new molds, as I understand it.

Dr. Rehwinkel.—The difficulty which occurred to me in regard to them was the length of the teeth. It did not seem possible to me to have the teeth short enough to afford room for these grooves.

Dr. J. Taft.—I also thought of that at the time, but possibly that might have been overcome if he had had the means of carrying out his idea, but I presume Dr. Hall had not.

Now, in reference to plates about natural teeth. The points have been pretty well presented here, and I fully endorse what has been said about cutting the plate back from the teeth. I have not, for a great while at least, been in the habit of fitting plates closely around the teeth. The argument is sometimes used that you should fit it just as closely around the necks of the teeth as possible, and that then the gum is less likely to be affected. But I have noticed that sometimes even in such cases the difficulty would ensue, that the gum would get out, and not only would the tooth but the alveolus as well would be injured. So that danger is liable to occur in two directions, decay and removal of the support of the teeth. As Dr. Berry said, it is necessary to discriminate in the different cases, and when there is a large amount of soft tissue, employ the means adapted to the case. Then the edge of the plates about the margin should be either further away from the teeth or fit them perfectly. If the integuments are not thick it might be made closer than in the other case. But I don't see what is gained by forcing the plate up close to the teeth. Get away as far as possible from the margin of the gum and then make such an adaptation of the edge of the plate as will not impinge upon mucous membrane enough to inflame it. That ought to be regarded in every case and arranged so that it will rest uniformly upon the gum and not make a pressure anywhere so as to induce irritation or inflammation. So, my idea for years has been, in adjusting a plate, to get it as far away from the natural teeth as possible—the farther the better. I regard this as an important point, because the natural teeth are better than artificial, and where there are only two or three natural teeth it is very important to save them.

Dr. W. M. Herriott thought the plan used by Dr. Carter probably a good thing. Around the air chamber he had a piece of gold, aluminum, platinum, or something of the kind coming in such a way as that it could only force down, being held there in perfect condition, allowing the roof of the mouth to be kept in better condition, because of that being a conductor of heat and cold.

He concurred with Dr. Rehwinkel in reference to partial sets of teeth; that is, that dentists should insist upon patients removing their artificial teeth at night.

Dr. H. A. Smith said that spring plates, to which reference had been made, were not usually satisfactory after being worn for any considerable length of time. The teeth were soon forced out of position by the pressure upon them, and the plate would drop. I recently saw a plate made in Germany, in which wooden pegs had been inserted after the plate had become loosened, so as to form bearings upon the natual teeth, in order to steady it in its place. These wooden pegs had to be renewed from time to time. I have seen the same method resorted to where gald plates were worn. Tubes of the metal to receive the wooden bearings were soldered on the plate. By the judicious placing of these bearings, many loose plates may be rendered comfortable and serviceable.

Dr. J. W. Lyder mentioned an operation in which a central incisor was made to give good satisfaction by soldering a very little flange upon the inner surface of the plate. It was a single porcelain tooth, the articulation being made as in cases where the operator was going to pack with gold packing.

Dr. J. Taft thought that by combining the plans spoken of, great advantages might be secured. In illustration of this, he said: If for example there were two or three good roots, and two or three teeth to be replaced, where teeth had been entirely removed, make a narrow plate which would occupy all these spaces, and where the roots were. Attach the plate to the roots by closely fitting collars. Solder into the plate; then when the teeth are attached, press the piece to its place on the roots. This narrow plate could be put into the space desired, and so much of the roots utilized as requisite, and the plate be finished up in a proper manner.

He stated that he had seen plates pivoted on roots worn for many years, and the question was whether narrow plates, properly adjusted in the way mentioned, could not be made so as to stand very firm and much better than the ordinary clasping, and better than plates pivoted into the roots, because of their having more bearing.

One thing referred to by Dr. Butler, he considered very important; that was not to destroy the pulp in roots where it was alive, but save it alive and treat it as in cases of exposed pulp.

DR. CORYDON PALMER—I would like to make a remark upon the adjusting of plates next to the teeth. It has been said, very truly, that it was best to keep as far away from the teeth as possible, and I admit that, but I would like something definite. How far can you get away? What has been said is hardly definite enough on this point. Why don't you give some plan or system? You can get mine. If I make a plate for two lateral incisors, supposing it to be a metal plate, I would, after securing sufficient size for the plate, which would contain an air chamber, extend an arm to each lateral incisor, make the chamber shallow and leave as much of the other parts exposed as possible to give strength.

DR. W. M. HERRIOTT.—If I remember distinctly, Dr. Rehwinkel, you undertook some years ago to see what could be accomplished in cutting away an upper plate, to see if it would sustain the teeth. What was the result?

Dr. Rehwinkel.—The result was satisfactory; and, I think, would be to anyone else, who had worn artificial plates before, and had gained some experience. You all know how troublesome it is sometimes, to convince patients that they have a properly fitting plate. Their want of experience in exhausting the air, and then their want of confidence in their own ability to manage the plate, and the constant fear that the plate may drop down into the mouth at an inopportune moment, destroy, for the time being, all the sense of comfort, and causes the patient often to become discouraged. If this occurs with the ordinary plates—with an air chamber even—you can imagine how improbable it would seem that such patients would be satisfied with a plate, of which the palatal portion is entirely cut away, and only enough of the plate left to cover the alveolar ridge. The plates are in shape like the gold plates made for the upper maxillary some thirty years ago, when spiral springs were relied upon. The method Dr. Palmer just referred to—leaving as little of the plate as possible around the margin of the air cavity—would be a great advantage, because the margins of the gums on the lingual surface of the teeth will be more thoroughly relieved of pressure and interference.

Dr. L. Buffett.—We all know the relation which the gum tissue has to the alveolar process of the teeth, that the gum tissue extends above the alveolar process. Now if the plate is brought in contact with the teeth so that there is pressure upon this gum tissue above the alveolus, you will have inflammation. If it stops at the margin you will have absorption. And I make this statement on the ground that there is always inflammatory action on the margin or under every plate. So if the plate does not extend to the edge of the alveolar process you will not have recession; if there is irritation at the edge of the process you will have absorption or perhaps have hypertrophy of the gums. —*Transactions of Ohio State Dental Society.*

ARTICLE II.

Researches on Hearing through the Medium of the Teeth and Cranial Bones.

BY CHARLES HERMON THOMAS, M. D.

Read before the Philadelphia County Medical Society, December 17, 1879.

[*Revised and Reprinted from the Philadelphia Medical Times, February* 28, 1879.]

In presenting the results of my investigations and experiments on the means and methods of transmitting vocal sounds to the internal ear by the way of the teeth and cranial bones, I shall but briefly describe the two instruments which have been exhibited here to-night, and which have received so large a measure of public attention during the past few weeks.

The audiphone resembles in form a Japanese fan, and is composed of vulcanite. When in use it is slightly bowed by cords connecting the handle and the upper edge, which edge is to be held in contact with the eye teeth of the hearer, the convex suface being turned towards the source of sound. The dentaphone is of the same model as a telephonic mouth-piece, its diaphragm being perforated at the centre for the attachment of a string, which serves to connect it with a small bit-piece, the latter to be held between the teeth of the hearer, who with one hand extends the mouth-piece with its opening towards and close to the face of the speaker, keeping the string in a state of tension.

It will be seen that the principles upon which their action is sounded are not new to us; indeed, are very generally known; but the remarkable results obtained by the application of these principles in the audiphone and dentaphone have fallen as a surprise alike upon the general public and the medical profession.

Hearing through the medium of the teeth and cranial bones is certainly not a novelty; on the contrary, the knowledge that sound may be thus conveyed has long been made use of for a variety of practical purposes. The application of the tuning-fork by aural surgeons in diagnosis is an instance familiar to all present. A patient of mine, whose hearing was much impaired in early life by scarlatina, informs me that in order to learn if his watch was running he has for many years been in the habit of placing it between his teeth, and of testing his clock also by applying his teeth to the mantel on which it stands, being otherwise unable to hear either of them. The same patient in his youth was accustomed to listen for the approach of a railroad train by placing his teeth upon the track; in this manner he was able to hear it some time before those who were about him, and who had normal hearing. A deaf friend enjoys music by placing one end of his cane against the piano and the other against his teeth. Another patient, an experienced engineer in charge of a stationary engine, has always practised listening to the sounds of its valves by placing one end of a stick upon the part nearest them and the other against his teeth, meanwhile stopping his ears with his thumbs, he having been taught this method as a part of his trade many years ago.

It has also been known that sound-waves produced in the air are communicated to contiguous bodies, causing them to vibrate in unison, though with varying degrees of intensity according to the density, elasticity, and form of such bodies. Furthermore, it was well known that vocal sounds were no exception to this rule, and that these, as well as others, could be transmitted, under suitable conditions, as longitudinal vibrations through long distances, as witness the familiar examples of the so-called "lovers' telegraph" and boys talking through a fence-rail. All this being known, it appears that a happy accident was all that was required to show that the complex vibrations of articulate speech as reproduced in solids might be conveyed through the teeth and cranial bones, and thus be rendered audible, as were the simpler sounds before mentioned; and, at the same time, to furnish a suitable means to accomplish the object.

My knowledge of the before-mentioned instruments and the results claimed for them led me to undertake a series of observations and experiments with a view (1) to demonstrate the principles upon which their action is founded; (2) to determine the practical value and range of use of these instruments; (3) to devise other and more convenient and less conspicuous forms of mechanism which might be substituted for them; (4) to improve the quality and increase the volume of the sound conveyed; (5) to discover new physiological and pathological facts relating to the functions of vocalization and hearing; and (6) to throw open to professional, and so to public, use the results gained, thus supplying data for further investigation and invention freed as far as possible from the restrictions which patents impose.

These researches involved the examination and oft-repeated re-examination of many deaf and partially deaf persons, the construction of new mechanism, and the testing, in different forms and under varied conditions, of a great variety of materials. In all this labor I had the valuable assistance of Dr. Edward D. Kirk, who will aid me in the repetition of several experiments before you to-night.

Before going farther, let me say that, though a number of novel results will here be shown, and some of them not without practical value, it is my opinion that osteophony as a subject worthy of study is not nearly exhausted, and that the future will develop other and far more useful applications of the method than have yet been reached.

The conclusions arrived at, briefly stated, are as follows:

1. As has been indicated, both the audiphone and dentaphone depend for their action upon the principles of acoustics that solids—in this case in the form of thin plates—vibrate in unison with the sound-waves produced in the air near them. In these instruments the vibrations are of sufficient force to be audible when conveyed to the internal ear through the medium of the teeth and cranial bones, independently of the ordinary channel of hearing,—the

transmission being direct in the audiphone and indirect through the conducting string in the dentaphone.

Though, within certain limits, sound-vibrations in solids are readily conducted in this manner,—becoming audible in all cases where the internal ear is intact,—the relatively slight vibrations produced in dense substances by sound-waves propagated in the air near them are not recognizable as sound, except where the normal exercise of the function of hearing is suspended by disease of the middle ear or obstruction of the external portion of that organ. Normal hearing so far exceeds that obtained by the means in question as to render the comparatively smalll addition made through them inappreciable and as nothing in the presence of the greater sensation.

The side of the sound-receiving sheet governs the distance at which the instruments will act, and the dimensions must be increased in proportion as the source of sound is removed. The audiphone is, therefore, much better adapted than the dentaphone for use at a distance, the latter being only suited to transmit sounds emitted near its mouth-piece. The bowing strings of the former are not at all necessary to its perfect working, as its arched form may very conveniently be given to it by the hand, pressing its upper edge against the teeth. Not tension, but the arched form is the condition essential to its proper action, for this form is that best adapted to impart the impact of sound-waves against its convexity, which is then expended as a thrust of the arch against the teeth, these forming one of its abutments.

2. That these instruments are of great value in a considerable proportion of cases of deafness there is no reason to doubt, but there is no just ground for the public belief that with their aid the deaf are enabled to hear as well as those with ordinary hearing. On the contrary, they supply, I am convinced, but a very small fraction of normal hearing,—much *less* than a *hundredth part.* Neither instrument adds in the slightest perceptible degree

to the hearing of those with perfect ears, except when the latter are securely stopped. I have repeatedly tested both instruments with this question in view, choosing as subjects those receiving from them decided benefit in listening to conversation and otherwise, and have as yet found no case in which a loud-ticking watch was heard when held close to the centre of the sound-receiver. Furthermore, when the watch was placed upon a large Koeing resonance box, thus multiplying the sound many times, and this placed so near to the diaphragm as barely to escape contact with it, still no sound was heard. Considering the law of acoustics, that the intensity of sound is inversely as the square of the distance of the sonorous body from the point at which it is heard, and taking into account the distance at which the sound described should be heard by the normal ear, my estimate of the strength, or rather the weakness, of the sound conveyed by these instruments will be seen to be justified. It is important that this be taken into account, for large numbers of the partially deaf suffer such disappointment at their failure to hear in full that they undervalue or altogether disregard a positive gain of many times their usual hearing. The difference between normal hearing and that derived through these means is hardly less marked than that between sunlight and candle-light; nevertheless, this very small fraction is of priceless value in many cases, for to those who practically hear nothing without them, who sit in acoustic darkness, the gain is all the difference between nothing and something,—scarcely less than infinity.

In view of certain strongly expressed statements which have obtained currency, the results to be derived from the use of the audiphone in deaf-muteism are likely to prove very disappointing. Repeated tests show that those who are able to hear with the aid of the audiphone hear *their own voices* perfectly without it: while those who are unable to hear their own voices without it can hear neither their own nor any other voice with it. It is, therefore, worthless to those who do not possess the faculty of self-hearing.

Practice is required in using either instrument, especially in cases where hearing has long been abolished, and the suggestion which has been made, to read aloud to the patient while he follows the printed words with the eyes, is a good one. Besides this, practice with the watch or tuning fork against the teeth, thus directing the attention to receiving the sound through the new channel, will prove valuable as an educator of the disused sense. The rod osteophone—hereafter to be described—has a special value for the same purpose.

This class of instruments should be in the hands and under the special direction of physicians, among other reasons, because caution is necessary to prevent their being relied on to the neglect of proper examination and treatment of the ears. Probably the most striking results to be found from their use would be in obstruction of the external ear by impacted cerumen; but manifestly it would be malpractice to make use of such means instead of effecting the removal of the offending material.

It is perhaps too soon to decide the relative merits of the ear-trumpet and the osteophone, but enough is known to render it probable that the osteophone will either substitute or supplement the former in many instances. And, certainly, it is far more agreeable for most persons to talk towards the surface of a curved sheet than into the cavity of a trumpet. Moreover, the distress and injury to the ears sometimes caused by trumpets are avoided altogether in the osteophones. As to artificial teeth, they limit to a great degree the value of most osteophones.

3. The audiphone is open to the objection that during its use it obscures to a certain extent the features of the user, and the dentaphone is held more or less in the line of vision. Both instruments are open to the still more serious objection that they each require the constant service of at least one hand during their use. With neither can the user hear when his hands are engaged in other employment. To remedy these defects I have made the following device.

A large receiving diaphragm is attached, in an arched form, to a rod of wood or metal. The rod is bent in the form of a pipe stem, one end of which is to be held firmly between the teeth as a pipe is held, thus enabling the user to listen to sounds about him, and, at the same time, leaving his hands free for other occupation. The diaphragm being below and away from the face, it is comparatively inconspicuous.

Ornamental fans of almost all sorts may be utilized for occasional use, and, when coated with shellac and tipped with ivory or hard rubber, may be made to answer fairly well, though they will prove unsatisfactory for ordinary uses. Many other forms of instruments have been found to answer the purpose of conveying vocal vibrations: thus, a piece of yellow pine wood, turned out into trumpet-shape, about two feet long, with an expanded end three inches in diameter, may be used for conversation, the small end being applied to the teeth of the deaf person and the opposite end held close to the mouth of the speaker. In this manner a very good volume of sound is conveyed. A tense string connecting the upper teeth of the two about to converse also answers the same purpose.

4. The tone of the voice differs materially when conveyed by different substances. Where these are lacking in resonance (as in celluloid and binders' board,) flatness is the result, while others which are over-resonant or over-persistent in their vibrations (as vulcanite and ferrotype metal) yield ringing or confused sounds. The quality needed is that possessed by good sounding-boards, of instantly responding to contiguous sounds and maintaining them during their continuance, and also of instantly ceasing to vibrate upon the cessation of the causative sound. This right sort of elasticity of resonance, that capable of reproducing human voice-tones in their purity, is possessed to a high degree by fullers' board (or press-board,) which, when treated with shellac varnish and thoroughly dried, has proved not only far better than other paper or cardboards,

but also a great improvement upon the sheet metals or hard rubber; lacking the "reverberations" and "roaring sounds" of the latter, as they are described by different patients upon whom they have been tested. Besides, owing to its greater flexibility, it is less destructible than either these or the thin sheets of wood which otherwise answered the purpose, while its cost is comparatively trivial.

A powerful osteophone, one that excels by many times in the volume of sound transmitted either audiphone or dentaphone, consists simply of a small rod of hard wood,—a convenient size being about two feet long and a quarter of an inch thick,—one end of which is placed against the teeth of the speaker, the other resting against or between the teeth of the person hard of hearing. If the speaker now articulates in a natural tone of voice, the vocal vibrations will be transmitted in great volume through the teeth and thence to the ears of the deaf person. It will also convey the voice distinctly when placed against the forehead or other portions of the skull of the hearer, and will convey perfectly audible speech from the skull of one to that of the other. Again, instead of the speaker holding it against his teeth, he may place it against the upper part of his chest, when, upon using his voice, the sound will be conveyed as before.

5. A physiological fact, not duly recognized or appreciated hitherto, so far as I am aware, is that sensible vibrations, produced by and corresponding to those of the voice, are propagated in the hard palate and base of the skull of persons speaking in ordinary tones. These vibrations are found to be transmitted throughout the skull with varying degrees of intensity, according to the point of observation chosen. In some localities—as the forehead, the front teeth of the upper jaw, and the top of the head—which are specially vibratory, these are so powerful as to be readily felt by the hand of the observer pressed upon these parts of another person during the act of speech. They may also be evidenced as articulate sounds, and dis-

tinctly heard as such, by any one, through the use of the rod-osteophone, for, as has been observed, by its means the volume of sound consciously received is a perceptible addition to ordinary hearing. Through their agency the voice may be conveyed directly from the skull of the speaker to that of the deaf listener by simply bringing the heads themselves in contact. The existence of these vibrations accounts for the further fact, before mentioned and which I have taken much pains to verify, that in certain cases of extreme deafness the patient hears his own voice with the utmost distinctness, even though speaking in low tones, when like sounds produced in his very ears would be totally inaudible. It seems evident, then, that auto-audition for deaf and well alike includes among its leading factors the bone-vibrations spoken of; and the topographical relations of the larynx and the vault of the pharynx to that portion of the temporal bone which includes the internal ear supply good *a priori* grounds, if any such were needed, for reaching the same conclusion.

ARTICLE III.

Neuralgia and its Treatment.

BY TRUMAN W. BROPHY, D. D. S., CHICAGO.

[Read before the Wisconsin State Dental Society, at Milwaukee July 16, 1879.]

The term neuralgia, which stands as the title of the paper I now have the honor of presenting to you, is derived from the Greek roots, "Neura," a nerve, and Algios, pain; hence, we have, when translated, nerve-pain, or pain in a nerve. "Under the head of Neuralgia," says Prof Flint, "are embraced a group of local affections characterized by pain occuring without inflammation, or any appreciable change in the parts affected. All that can be said of the pathological character of these affections is, they consist in a perversion of sensibility." Accepting this as the correct definition of *true* neuralgia, we have to consider another species of nerve-pain, induced by local irritation, the result of which is an engorged condition of the capilliaries, and their pressure against the nerve-sheath produces pain. It is this species of neuralgia, which the dental practitioner is most frequently called upon to treat.

As the result of investigation by Tadcliff, an English scientist, a nerve was found to be analogous to the pole of an electric battery. The nerve-sheath acting as the negative pole, while the nerve proper acts as the positive. It is by this means he accounts for the transmission of sensation, from the periphery of a nerve, to its ganglion, thence to the seat of sensation. Although neuralgia is the cause of suffering of the greatest severity, it is not, strictly speaking, a disease, neither do the most intense and long continued attacks terminate fatally. Patients are, in many instances, subject to neuralgic pains during the greater portion of their lives, and finally die of diseases which were not induced by, nor in any way connected with neuralgia. According to an analysis by Valleix, a French physician, as to the manner in which neuralgia terminates, he found, that in seven-ninths of the cases examined a permanent cure took place. In one.ninth there was improvement without recovery, and in the same proportion there was neither cure nor improvement.

There has been considerable speculation among investigators, as to the cause of neuralgia, when it cannot be ascribed to any apparent lesion; foremost among whom is Dr. Francis Edmond Anstie, who claims that true neuralgia *is* a disease. In the third chapter of his monograph on this subject (p.110) he says, "I expect to convince most readers, that the essential seat of every true neuralgia is *the posterior root of the spinal nerve, in which the pain is felt,* and that the essential condition of the tissue of that nerve-root is *atrophy,* which is usually non-inflammatory in origin." The comments of the best authority, however, admit that such a condition is met with, but regard it as an explanation of peripheral pain. I fail to find any one willing to support Dr. Austie's theory of atrophy of the posterior root of the spinal nerve. . . . .

It is not my intention to comment on the causes of *true* neuralgia to any extent, but believing that lesions within the oral cavity are the predominating causes of neuralgia, and that it should receive more attention and be thoroughly understood by us, as in my opinion the oral or dental surgeon is, owing to the very nature and location of the disorder, the proper one to treat it. I shall attempt, therefore, to point out some of the causes of

TRIGEMINAL NEURALGIA,

and its treatment. In doing so I shall advance no new theories, for I have none, but shall relate a few cases which I believe to be of deep interest to us as a profession, and which have not heretofore come to your notice.

There are few persons affected with neuralgia, as the term is generally understood, that seek the services of the practitioner of dentistry to obtain relief. When a patient thus affected presents himself to us, he usually denominates his trouble "toothache," and believes that the removal of a certain tooth, or teeth, will effect a permanent cure; when in fact, the teeth in some instances are in no way implicated, the pain emanating from other causes. It is in the treatment of such cases that the best of judgment is demanded, and the ability of the practitioner put to the test, to diagnosticate with the accuracy to be expected from one professing to possess the requisite knowledge of pathology and therapeutics, to treat with reasonable success these affections, the causes of which are sometimes very obscure, and which are frequently, erroneously attributed to the teeth. All members of our profession have no doubt seen persons whose teeth have been removed by advice of their physician, with a view of being relieved from general neuralgia. The teeth of these persons were pretty good, none indeed being sufficiently carious to produce odontalgia. We have observed, that in some such cases the result desired was not obtained, the pain not being abated even in the slightest degree. On the contrary, the removal of the teeth has been to the patient a serious and irretrievable loss; all of which must be regarded as the result of failure, or inability, to correctly diagnosticate the condition.

On the other hand we have seen persons, who have been under treatment for neuralgia for months, and in some instances years, taking medicine almost daily, and yet obtain only temporary relief, if any; when upon close examination of the teeth, removing all the fangs which are not sufficiently firm to be crowned, and properly treating and filling such teeth as can be preserved, the neuralgia quietly, and in many cases effectually passes away. The exciting causes of *true* neuralgia are usually a damp, cold atmosphere, miasmatic influences, or an anæmic condition of the system; to this we might add syphilis. As before stated, the species which we, as a profession, are most frequently called upon to treat, emanates from some lesion, or the presence of some substance which impinges upon the nerve-sheath, thus causing pain.

Of these causes, by far the most common is nervous odontalgia. However, it may proceed from periostitis, exostosis, the contracted arch and crowded teeth, partial calcification of the pulp, pulp-nodules, or fractures of the maxillary bones, causing spiculæ of bone to come in contact with, and irritate the nerve. This latter condition may, and doubtless does result in some cases, from the unskillful use of the forceps. Neuralgia may be induced by a cicatrix, which contracts the soft tissues adjacent to the nerve, thus producing pressure and consequently pain.

Indeed, it may be caused by anything which interferes with the organic functions of life. What, then, shall the first step be to alleviate our suffering patients, from this dreaded and terrible affection? Answer: search for, appreciate and remove the cause; and since trigeminal neuralgia originates most frequently from carious teeth, our attention should always be directed to a thorough diagnosis of the mouth. If the teeth present an appearance of soundness, be not satisfied with this, as there are many cases where caries are proximately situated, and so obscure that time is required to secure sufficient space to accurately diagnose. Some will doubtless say, why do you speak of odontalgia or exposed nerve as the origin of neuralgia? Why do you confound the terms? or how is odontalgia distinguished from neuralgia? In answer, I will say, the sensations produced by neuralgia are the same and identical with nervous odontalgia.

We have all been consulted with reference to pain, described by our patients as being of the neuralgic type, periodical and lancinating. The patient is unable to locate it, but imagines it may possibly proceed from the teeth. A close examination reveals, along the surface of a tooth adjacent to its neighbor, and in the majority of cases just about the free margin of the gum (which is absorbed) and underneath the enamel, carious dentos; this may or may not be broken down. The demineralized tooth-substance at this point may be in its perfect original shape, but by probing it is found to be a soft, gelatinous mass, which easily allows infiltration of the secretions of the mouth, hence the source of pain. Such cases are most frequently observable in patients of middle or advanced age. In case fractures of the bone have occurred, a free incision should be made and the disconnected bone removed. Some of the most aggravating cases of neuralgia are due to fractures of the bones, necrosis following, with a disposition of new or secondary bone, which so involves the sequestrum that the efforts of nature cannot expel it.

The skill of the surgeon, therefore, must come to the rescue. The effect of the so-called pulp-nodules and partial calcification of the pulp upon the nerves supplying the teeth is familiar to all. We realize the necessity of relieving the suffering, and yet, our task is one surrounded with difficulty of the most complicated nature, more especially so when the patient is unable to locate the seat or origin of the pain. To diagnose correctly the cause of neuralgia, when due to pulp-nodules, when no particular location of the pain can be designated by the patient, is a task worthy of the most profound observer, and the most thorough and accurate diagnostician. Fortunately, however, cases where the pain cannot be located are rare. The teeth containing these excresences or nodules within the pulp-canal, are usually sensitive to the tap of an instrument. The pain is increased by quick changes of temperature, or upon hard pressure. The irritation of the tooth-pulp and the dental periosteum, occasioned by these nodules, is followed by an elongation of the tooth, sometimes slight, but distinct. This is probably the most marked symptom of the disturbance in question. These nodules doubtless are produced by the odontoblastic membrane which has been subjected to gradual, persistent, prolonged, though slightly irritating influences.

The treatment for this source of nerve pain is, of course, to remove the cause, and that can be accomplished by drilling to the pulp canal and carefully removing the little, pebble-like, ossific bodies, with a very fine pointed excavator. If, however, the pain experienced in their removal is very severe—as it generally is—the arsenious paste may be applied, after first reducing the congestion of the blood-vessels, then the nodules can be painlessly removed and the roots treated according to the approved modes of the day.

Exostosis of the fangs of the teeth, a fruitful source of neuralgia is, indeed, as difficult to diagnosticate as pulp-nodules, unless for fangs affected and enlarged to that extent which clearly locates and defines the affection. In exostosis, as in pulp-nodules, it is gratifying to say that the pain is more localized than diffused.

The sensation produced by dental exostosis is that of fullness, and it is when the alveolus does not yield by absorption, in proportion to the growth of the tumor, that neuralgia is produced, sometimes of the most painful type, and if not understood, it may be treated an indefinite time without any beneficial effects.

My experience and observations teach me that exostosis results, in a very large majority of cases, from irritation of long standing, and final death of the pulp. Sometimes, it occurs upon the fangs of perfectly sound teeth, but, far more numerous are the cases where a portion, or the whole of the crown of the tooth, has been destroyed by caries. A sound tooth, affected with exostosis, not always, but usually, has characteristics differing in a marked degree from its fellows, and it is through this medium the offending member is pointed out. I allude to the consolidation, in the whole tooth-structure, of calcium salts which renders the resisting force of the organs, to the instruments, greater than is ordinary, and far in excess of the adjacent teeth. This condition can usually be recognized by the experienced eye.

The treatment for neuralgia resulting from exostosis is, to remove the affected tooth. Some of our professional brothers, with pride in preserving such teeth, might extract it, remove the tumor and replace the tooth. The fears of tetanus, however, and a vivid recollection of the loss of a patient of this disease, by a professional friend, who had replaced teeth, after removing the exostosis, would debar your essayist from such a practice.

Mr. Salter, in his admirable work on "Dental Pathology and Surgery," describes a case of intense neuralgia of the eye-ball and face, which caused a change in the color of the iris, resulting from carious teeth.

This case was indeed a remarkable one. It is so important to us, and illustrates how men of the highest medical skill sometimes fail in making a correct diagnosis of lesions, or affections, which have their origin in the teeth, that I shall quote it. He says, "Mrs. C., aged about thirty years, was sent to me by Dr. Oldam on the 21st of June, 1867. She was suffering from neuralgia of extraordinary severity, affecting the left eye-ball, and the left side of the head and face. She had suffered almost continuously for ten years, the attack commencing on her recovery from a bad confinement; and no medicines had given her distinct relief. The most singular and interesting part of the case is, that the iris of the affected eye has completely changed color under the influence of the continued pain. Both her eyes were originally of a deep and bright hazel color; the iris of the right eye remains as it was, but the left has changed to a dull gray, without any trace of the original hue. This change has occured progressively till the eyes are now as if belonging to two people of totally different complexion. No artificial painting could exhibit a more strange and striking contrast. When this lady came to me she was in a pitiable condition, suffering such agony as I have seldom witnessed, and worn out and exhausted by the continual sleeplessness which the pain had occasioned. Upon examining her mouth, I found that the left lower dens sapientia and the first upper bicuspid were badly carious. I removed these teeth, and the operation was attended by a terrible paroxysm of neuralgia, but upon recovery from this, the patient expressed her conviction that the extraction of the teeth had cured her, and so it proved. From that day till the eighth of October, three months, she was entirely free from pain; she had scarcely known such immunity, even for three days, since her neuralgic suffering commenced, ten years before. As she expressed it, 'it was like a new life to her." The only comment I wish to make upon Mr. Salter's treatment of this case is, I believe he would have done the lady a better service had he treated, and, if possible, preserved these teeth.

He continued: "On the eighth of October the old pain came back again, and my patient came to me on the tenth, just in the condition she had been at first. I now found that the second upper bicuspid was carious, and intensely tender. Upon its removal a considerable exostosis was seen on the root. The pain vanished with the tooth, and the patient wrote to me, a week after, saying she was quite well. The iris of the left eye, however, has never gone back to its original color, but remains a leaden gray. The eye does not appear to have undergone any other nutritional change: its vision has not been affected."

A case of neuralgia, of great importance to the dental surgeon, was recently described to me by Dr. Deering, of Chicago. A lady about forty-eight years of age, strong and healthy, residing in Kansas City, called on a dentist of that place to be relieved from severe neuralgic pain, described by her as analogous to toothache; she had lost all her superior teeth about twenty-five years earlier, and had since worn artificial teeth. The pain was located on the left side of the arch, in the region of the antrum. The dentist examined her mouth carefully, and concluded that the plate she was wearing was the sole cause of her suffering.

The lady at once had a new plate constructed by him, but her suffering was not in the least abated. The dentist thereupon called a surgeon, who also examined her mouth, and pronounced her condition the result of a tumor upon the palatine plate of the left superior maxillary bone, and advised an operation. She consented. The mucous membrane was divided, a chisel and mallet were brought into requisition, and an effort made to remove the tumor. Having no success, however, he desisted, feeling he was not equal to the case.

The following day the face was greatly swollen. The surgeon assured her that her's was an unusal case, and advised her to go at once to Philadelphia, and employ a distinguished surgeon of that city, who would effectually cure her. Following his advice, she went to Philadelphia, via Chicago.

Stopping here a few days with friends, she was requested to call on a dentist for his opinion.

He examined the case and informed her that she was on the right track. It was a very serious matter and required the highest skill to treat it. On arriving in Philadelphia, she consulted the eminent surgeon, and he pronounced the trouble ulceration of the mucous membrane of the antrum. With a drill he made an opening into the antrum, and through the opening applied the usual remedies for this disease. This was continued for some time with constitutional treatment, consisting af quinine, iron, and other remedies which were indicated.

This treatment was continued eighteen months, with very little, if any relief. She left Philadelphia to return home, with directions to continue the quinine two months longer, and report by mail.

She stopped in Chicago, on her return home, and called on Dr. Deering, who was the first to correctly diagnosticate her case. The pain was still very severe, and located in the region of the antrum. A protuberance was observed midway between the alveolar ridge and the palatine-suture of the maxillary bones. An exploring instrument was passed through to the enlargement, and an idea formed by the doctor of the nature of the trouble.

He then questioned her in regard to her dental history. She informed him that her teeth were all extracted when she was about twenty-five years of age.

The question was then asked, "Are you sure they were *all* removed?" It then occurred to her for the first time that on each side of her mouth the second deciduous molar remained at that time, the dentist having called her attention to the fact, and remarked that possibly she would sometime get the second bicuspid teeth. An operation was performed, a bicuspid tooth was found imbedded lengthwise in the maxillary bone, with apex well into the antrum. This was with some difficulty removed. The crown was chipped off a little by the Kansas City surgeon, who failed to remove it, otherwise the tooth was in a perfect condition. After the effects of this operation had passed away, the patient, for the first time in four years, had perfect immunity from pain. Three months subsequently, however, pain of the same character was felt on the opposite side, and another operation was performed with the same result. Dr. Deering kindly brought this lady to my office, and upon examining the mouth, two slight grooves were seen on either side where the teeth were removed. No neuralgic pain has been felt since. The opening made into the antrum, however, has not closed. The inflammation brought on by the use of the strong medicinal applications is, indeed, difficult to reduce. No evidence of the operation, other than that spoken of, exists. Thus a patient suffered pain of the greatest severity during so long a period, all owing to failure on the part of the professional gentlemen she had employed to accurately diagnosticate her case.

The lesson to be learned from this case is, think of more than one thing when making up a diagnosis. This was a case belonging strictly to dental surgery, and had the dentist possessed sufficient knowledge to accurately diagnose the case, the difficulty could have at once been corrected. As before stated the cause of true neuralgia, is a question upon which the most eminent pathologists cannot agree.

It is sufficient for our purposes, however, without discussing the different theories advanced, to state that it is generally conceded, that true neuralgia results from some organic disturbance, as inactivity of the liver, and consequently constipation of the bowels; especially is neuralgia due to habitual constipation. In the plethoric patient, neuralgia may usually be attributed to the presence of uric acid in the blood, but this class of patients is not often subject to neuralgic affections. By far the most common cause of true neuralgia is anæmia; a pallid, pinched-up face; a dull, sunken eye, accompanied by poor appetite: such a person is exceedingly liable to neuralgic attacks.

Romberg, when speaking of anæmic conditions and neuralgia resulting therefrom, says, "It seems as if pain were the prayer of the nerve, for healthy blood." In the treatment of neuralgia resulting from this cause, the protracted use of tonics must be employed. If, however, the attacks of pain are very severe, they may be relieved by the use of narcotics. But permanent relief cannot be looked for until the system is built up. If the patient suffering from neuralgia resides in a malarious district, quinine is indicated. Lead poisoning is another cause of neuralgia, which I have no doubt has been caused in many instances by the unscrupulous dentist, who has repaired, or had repaired by a tinner, silver and other metalic plates, with soft solder, lead being the chief constituent.

An interesting case of trigeminal neuralgia came into my charge two years since. A gentleman, aged thirty eight, consulted me with reference to pain located by him in the left second superior molar. A careful examination revealed no caries, no accumulation of tartar, no periostitis, but slight congestion of the gums; also slight inflammation of the face at the terminal branches of the infra-orbital nerve.

My patient requested me to extract the tooth described. I informed him of its soundness, and refused to comply with his request, also informing him that his trouble was neuralgia. I applied Tr. Aconite to his gums, and prescribed as follows:

℞
Prusiate of Potass., - - - - ʒi.
Eau de Cologne, - - - - } aa ℥i
Tr. Aconite (Flemming's,) - - }
M. Sig.

Dilute, if too strong, with water, apply with sponge every two or three hours. I directed him to keep warm flannel constantly applied to the affected side, and report the following day, when I found his condition much improved, the paroxysms of pain occuring at greater intervals and less severe. I prescribed Sulphate of quinine grs. xxiv. in four doses, a dose every three hours, and to continue the local application.

These directions were carefully followed, and two days after he pronounced himself well. Five days after this, however, another paroxysm of pain returned, when he declared that I must extract the tooth, but I dissuaded him, and put him again on the same treatment, with the same result. I saw my patient on Friday, three days after the last administration of quinine, when the information of his recovery was with great pleasure received.

The cause of the neuralgia in this case was by no means clear to me, as the patient was unusually robust and strong, not being subject to any ills. During the subsequent week, however, light was thrown upon the case. My patient informed me that on the Sunday following his last conversation with me, a physician removed from him a tape-worm forty-eight feet in length. Then the cause of the disturbance of the nervous system, and consequently the neuralgic pain, was at once understood. The disturbance or agitation of the system in this case must have been very great.

The day subsequent to the operation, the local applications to the face were frequently resorted to, to control the occasional paroxysms of pain.

I saw this patient, during the past month, when I learned that no trace of neuralgia had since recurred. Another case of neuralgia, of great severity, came to me during the past week. A gentleman of sedentary habits, aged about fifty years. The pain in his case was in the terminal branches of the infra-orbital nerve, also in the supra-orbital. Finding no carious teeth, which would be liable to cause the disturbance, I questioned him in regard to his general health, occupation, &c. I found that he was subject to constipation of the bowels to such an extent that it was necessary to take medicine every morning.

The pain was steady in this case; it came on at about ten A. M. and would subside at about six P. M. He had suffered only a week, but he said it seemed like a month. The eye on the affected side (the right side) was greatly inflamed, and the tears were constantly flowing. The mucus, from the right nostril also flowed profusely. This I believed to be a case of *true* neuralgia, and I gave him the following:

℞

Quinia Sulph. - - - -	grs. xxiv.
Acidum Sulphuricum (dil) - - -	ʒ j
Elixir Taraxacum, a. d. q. s. - -	℥ ij

Sig.

To be taken in four doses; one dose every three hours. He called two days subsequently and reported a perfect immunity from pain. I have not seen him since, and therefore believe it has not returned. A rule which I have adopted, is as follows: When a patient presents himself, whether suffering pain or not, to first carefully remove the salivary calculi and cleanse the teeth; then medicate those which require it, if any, then extract every fang in the mouth deprived of its crown, excepting, of course, those which may be restored to usefulness by mounting them with crowns. This done, I am prepared at the next sitting to make a more intelligent diagnosis for neuralgia or other affections.

We should firmly object to allowing our patients to dictate what we shall do If they wish our services, and have confidence in us, we should insist on doing what we know to be for their interest.

In writing on this subject, gentlemen, I may have wandered to some extent, and transcended the prescribed bounds of dentistry, according to the views of some; but if I have done so, it is my weakness, and I am not responsible for it. The all-absorbing question again persists in thrusting itself before us: Are we to treat surgically or therapeutically diseases of the teeth, and those diseases which emanate from the teeth? Are we to content ourselves with filling carious teeth, oblivious of the chemical action which brings about their disintegration, a recurrence of which *will* follow the most perfect manipulations, without even an effort on our part to correct it?

Shall our knowledge of surgery be confined to extracting teeth? Shall our occupation be that of plate-makers? Is our knowledge of pathology to be confined to congestion and inflammation of the dental pulp and gums? Shall we say our profession is conversant with the branches of medical science, materia medica and therapeutics; when creasote and arsenious paste are the sole stock of remedies in the hands of hundreds of men practicing dentistry in this country, and making local applications to inflammation or suppuration of the mucous membrane, when in many such cases no man can cure them without constitutional treatment? And even in this advanced and enlightened age, to see our professional brothers, presumably in the full possession of their reason, surrounded by books of reference of the highest order, and periodicals filled with the richest fruit of experience, observation and knowledge; practicing their profession after the ideas of the generations of the past? Or shall we not put forth a greater effort in acquiring knowledge of surgery, pathology and therapeutics, as far as they can, in any *way*, *shape* or *form*, be associated with, or applicable to, our specialty? My answer is, Yes. What the better men in the dental profession stand most in need of to-day is a greater, more extensive knowledge of the action of remedies, and how to administer or apply them.

I care not to be a general practitioner of medicine; my profession is a better one for a young man. The views of many are opposite to mine; but as for me, I do not care to suffer the humiliation of turning over to the general practitioner of medicine cases which are strictly within the province of dentistry, on the ground of not understanding them.

The great work to be accomplished by our profession is to prevent, if possible, caries of the teeth. If, however, we fail in this, our next duty is to arrest it. This, in my opinion, can only be accomplished by the aid of a knowledge of chemistry and therapeutics, a complete control of the patient, thus enabling the practitioner to prevent or correct a contracted arch and crowded teeth, a strict observance of the laws of hygiene, and last, but not least, the careful, trained and skillful hand of an honest, conscientious dentist. So far as we succeed in preventing and arresting caries of the teeth, just so far we shall be instrumental in doing the greatest service within our power to humanity, and nipping in the bud the condition which in some instances grows to such gigantic proportions, in the form of trigeminal neuralgia.—*Missouri Dental Journal.*

ARTICLE IV.

Death of the Dental Pulp Provoked by External Violence.

BY DR. G. DOP.

[Translated for the *Jairus* by W. A. Briggs, M. D., Sacramento, from *Le Progres Dentaire.*]

Patients often consult us on account of abscesses or fistulæ of the gums in connection with teeth entirely exempt from lesion. If we interrogate them as to the causes of this accident, they nearly always reply that its origin, of which they preserve no precise remembrance, was spontaneous and, generally, unaccompanied by pain.

But, as every effect pre-supposes a cause, we assert, notwithstanding the most formal denials of the patient, the pre existence of violence or external irritation; and we are the more positive in this assertion since these accidents, when occuring in young subjects, are always met about the anterior teeth.

What is the cause of this abscess? What is the mode of its production? These are the two questions that first present themselves to the mind of the observer.

Nearly all patients, in reviewing the past, finally recollect that a blow has been experienced, and that the abscess manifested itself some months, and, in certain case, even two years afterwards.

This is not the place to discuss the anatomy of the dental pulp; we merely observe that its structure is almost entirely *vaso nervous.* The tooth, however, has another source of vitality of which we must take cognizance; it is called the alveolo-dental periosteum, and further on we will recognize the important function of this peridental membrane when the pulp, destroyed or calcified, is unable to maintain the physiological activity of the tooth.

We will suppose that a healthy tooth has received a blow, not violent enough, however, to produce either its fracture or its avulsion. The direction of this blow will be either perpendicular or parallel to the long axis of the tooth. What occurs in the former case? The tooth transmits the shock to the alveolar walls (anterior or posterior,) and bruising, more or less severe, of the peridental membrane may be the consequence. Inflammation of the injured part ensues. If circumscribed, this inflammation may spontaneously resolve; if not, it may invade, step by step, the entire alveolo-dental periosteum. At this moment the patient may experience some local uneasiness, of which he takes no particular notice.

The inflammation, thus abandoned to itself, by contiguity extends to the dental nerve at its entrance into the canal, and may more or less rapidly extend to the dental pulp. When the pulp is invaded, symptoms of strangulation may occur and give rise to pain that the patient will endure, nearly always attributing it to neuralgia. The duration of this condition, which, we must not forget, is established long after the occurrence of the provoking cause, is, on account of insufficient data, difficult of determination. We presume, however, that this painful period is not of long continuance, since patients do not consult us until the abscess has already been established for some time.

Take, for example, a case in which the jaw is injured by a resisting body—a table. Whether the mouth be open or closed, the various lesions will be characterized by greater or less intensity or by the seat of the abscesses that will later form either in the superior or inferior maxilla. In consequence of this shock, the concussion or "ogntre coup" of the dental pulp may determine immediate inflammation of the latter, or, indeed, the phenomena of its functional excitement.

The pulp, as we have said, is almost exclusively composed of vessels and nerves; but between these two elements is found a blastema (blasteme,) in the midst of which nucleated cells are distributed.

If we examine the physiological process, we may, by comparing with them the morbid condition of which we speak, more clearly explain the various stages that lead to the death of the pulp.

In children the pulp cavity and the dental canal are very large, and with advancing age they diminish in size in consequence of osseous deposits that form upon their walls. In old people we often find healthy teeth whose natural cavities are almost entirely obliterated. This normal phenomenon is easily explained: As the vital powers fail, we observe, in certain organs, structural alterations which consist in the formation of calcified patches of greater or less extent; the dental pulp is subject to the same influences, and these osseous deposits accumulate successively on the wall of its cavity. We also observe the same phenomenon in the case of abrasion of triturating surfaces, but here there are two different modes of the production of dentine.

When use has destroyed a certain thickness of the tooth, the pulp, which is thus approximated to external irritations (heat, cold, violence,) secretes layers of dentine which remove it from these irritations. As this abrasion continues, the restorative efforts increase, and the time comes, at last, when the entire pulp is replaced by dentine. Frequently, however, these processes do not develop so regularly or so favorably for the patient. In fact, these excitations, by impressing the pulp too violently, instead of being physiological, may become pathological, and reproduction no longer proceeds under the influence of the simple efforts of nature. There then occur irregular deposits, scattered without order and without utility throughout the pulp; hence, extremely painful strangulations, in whose train follows destruction of this organ.

If we bear in mind what occurs during life or in certain cases of abrasion, we will readily comprehend the formation of dental abscesses, when the shock received corresponds with the long axis of the tooth. As a result of concussion of the pulp mass, a slight inflammation develops. This may limit its influence to a simple physiological excitation of the organ. Then nodules of dentine develop irregularly, and their advent gives rise to a series of inflammatory extensions, followed always by a numerical increase of these nodules. It is then no longer possible to hope for resolution. The inflammation extends incessantly; small purulent *foci* develop, and all the parts, hitherto healthy, are soon transformed into pus.

We now find ourselves in the presence of a tooth whose closed cavity contains purulent and gaseous products. New phenomena appear; the alveolo-dental periosteum, which carpets the fundus of the alveolar cavity, inflames by contact with the products of decomposition. At the point of the root, and, as it were, inserted in its circumference, develops a small cavity, lined by pyogenic membrane, which increases in capacity as the liquid secretions accumulate. This pyogenic membrane is formed from a mass of plastic lymph exuded at the root-point in consequence of inflammation of the periosteum. This sack, constantly increasing in volume, compresses the alveolar wall, producing its absorption at a point that serves as an exit for the pus. This pus comes in contact with the deep surface of the gum, distends it, inflames it, separates it, and finally perforates and creates a fistulous opening. Such is, in a few words, the origin of abscesses, following the death of the pulp of healthy teeth subjected to external violence.

We will now briefly relate some observations that permit us to establish a rational treatment of these abscesses; a treatment whose object shall be to assure the preservation of the tooth by preventing the formation of new abscesses:

Case.—Our first case is that of a girl of fifteen years, who consulted us last year for the riddance of two abscesses, situated internally to the inferior maxilla, in the region of the two central incisors. After a careful examination, we were unable to discover on these teeth the least trace of lesion; neither spot, nor caries, nor crack, nor fracture, nor abrasion. Both teeth were slightly loose, and pressure, as well as percussion, produced a little pain. Thermic excitations provoked no painful sensation. Our interrogations, although as complete as possible, threw no light on the etiology of these abscesses. The patient asserted that they had no discoverable cause, and that they had arisen spontaneously. There had never been any pain, and at the time of our examination, the abscesses had already been six months in existence. As these responses were scarcely satisfactory, we besought the mother to come to our assistance, and it was only upon a pressing appeal to her memory that we obtained the desired information. The mother recollected that about two years before the simultaneous appearance of these two abscesses, her daughter had fallen upon her face and struck her jaw upon a wooden stool.

We then undertook the cure of these abscesses, that we might preserve the teeth that had given rise to them. Convinced of the death of the pulp, we had but one end to attain, the permanent removal of the source of the pus.

A pyogenic sack undeniably existed. It was necessary then, as in general surgery, to penetrate within its cavity, and by modifying its secreting surface, develop in its walls an adhesive inflammation sufficient to entail the disappearance of the abscess. For this purpose we made an opening, with appropriate instruments, upon the lingual surface of the two incisors. This opening extended to the pulp cavity, permitted the introduction to the extremity of the dental canal of fine barbed broaches intended to withdraw those remains of mortified pulp, not already disorganized by the putrid decomposition.

Then taking another smooth sound, whose free extremity was wrapped with a bit of cotton, we carried the tincture of iodine within the cavity of the sack. The small cotton tube was left in place; two days after, the abscess was notably reduced in size, and the erythemutous redness surrounding it diminished in extent. This treatment was continued for a week, and at the end of this time all traces of anterior lesions had disappeared. The patient, believing the cure complete, wished to discontinue treatment. Being skeptical, and knowing that relapses are to be feared in these cases, we insisted upon continuing the treatment for another week. Abandoning cauterizations with tincture of iodine, carbolic acid was applied by the same procedure. After four cauterizations, we considered the abscess definitively cured. One part of our task was accomplished; it remained for us to prevent relapses.

We were confronted by two teeth, whose radical canal and puly cavity communicated with the external world. If they were abandoned in this condition, the patient would be exposed to the formation of new abscesses. In fact, alimentary debris might be accidentally introduced into the cavities of the teeth, and by its decomposition provoke an inflammation about the apex of the root that would pursue the same course as the original one. Obliteration of these cavities is then indicated.

Just here we should make a remark of intrinsic importance: We have regarded the abscess as radically cured, and notwithstanding all the signs favorable to this opinion, it should be prudently controlled.

For this purpose it suffices to insert a temporary filling, which should be removed upon the first signal of alarm. A bit of cotton saturated with collodion or a solution of gutta-percha in chloroform will perfectly subserve this end. The cotton thus prepared assumes a relative hardness that prevents the imbibition of buccal fluids, or liquid aliment, and assures the impermeability of the dental canal. If, after the lapse of a certain time, fifteen days or a month according to the case, no accident supervenes, the temporary *tampon* is removed, and a permanent one introduced.

But, suppose this tentative *tampon* of some easily removable substance, has been followed by slight pain and swelling in the region of the primitive abscess; we must recur to the applications of tincture of iodine and carbolic acid.

To conclude this case, we will remark that the temporary *tampon* succeeded perfectly, and some time after a gold one was inserted in the usual manner. The cure is permanent.

We might multiply these examples, but not to exhaust your patience, we will briefly present two others that will abundantly vindicate the treatment instituted:

Second—Miss M. G., seventeen years of age. Abscess situated in the region of the left, lower central incisor. Blow from a cup eighteen months ago, abscess formed a year after the accident. Drilling into the pulp cavity; cauterization of the pyogenic membrane with carbolic acid for fifteen days. Gold filling; permanent cure.

Third.—C. L., fifteen. Palatine abscess, of fifteen days duration, in the neighborhood of the right, superior central incisor.

Six months before the appearance of this abscess, a blow had been received on the upper lip from the head of a cane. Slight fluxion, no pain; cauterization for three weeks with carbolic acid; perfect cure; gold filling after temporary *tampon*. The abscess has not reappeared.

We should remark, however, that all those teeth, whose pulp has suppurated, lose their normal color, their lustre, and turn brown.

Conclusions.—Every alveolar abscess, in the region of a healthy tooth, is caused by external violence.

It is curable, and treatment assures the preservation of the tooth.

This treatment consists in drilling into the pulp cavity so as to permit cauterization of the pyogenic membrane by means of small *tampons* saturated with tincture of iodine or pure carbolic acid.

Finally, the abscess being thoroughly cured, relapses are prevented by filling.—*Dental Jairus.*

ARTICLE V.

Extraction of First Molars.

BY A. W. HARLAN, OF CHICAGO.

The diversity of opinion concerning the treatment of these teeth is so great, and their proper treatment under all circumstances so difficult to determine on the first visit of the patient, that many operators either hurriedly extract them, or are satisfied to as hurriedly fill them with inferior materials, thus hastening their ultimate destruction. I desire, therefore, to offer a few words with reference to the proper time of extracting them, and a few indications therefor.

First.—In all mouths where it is apparent that both jaws alike give evidence of being contracted from a normal-shaped arch, and the teeth are large and imperfectly developed, my rule would be to extract all four of them at the same time, even though only one of them should be seriously affected by caries.

Second.—In all cases where the patient is presented previous to the eleventh year with one pulpless molar of the above class, and the other three already so badly decayed that one or more pulps are exposed, I would extract, even if the shape of the arch were normal and no tendency existed to indicate that the teeth would be crowded or irregular in their final arrangement.

Third.—The rule is to extract when a patient is presented who has previously lost one of these teeth before the eleventh year, unless one of the bicuspids has also been extracted on the opposite side of the arch and not from the same maxilla. Then, perhaps, it would be better to extract the corresponding bicuspid; but if the articulation of the teeth were interfered with by so operating to any appreciable degree, the bicuspid should be extracted, and the remaining molar from the maxilla from whence the other had been extracted. Further, I would never extract a molar, or the molars of the sixth year, for the purpose of correcting an irregularity of the teeth anterior to them, if they were all alive and of reasonably dense structure.

Fourth.—The rule would be to extract the sixth year molars after the eruption of the second bicuspids in those cases where the teeth are large and were erupted early, and are of a chalky structure, from a perfectly normal arch, as these teeth invariably show caries on their distal and mesial surfaces, while there are no teeth in contact with them, often as early as the seventh to the eighth year, and it is next to impossible to save them. They should be extracted about the tenth year.

Fifth.—It is proper to extract what are known as honeycombed teeth, and those teeth showing arrested development as a result of exanthematous diseases, and also those teeth which bear the marks of inherited disease—meaning by the above descriptions teeth almost wholly devoid of shape and destitute of enamel, and already extensively decayed previous to the eighth or ninth year.

Conclusions. My observations of the mouths of children and adults, and study of authorities, lead me to conclude that in the above-named cases, the prospect for the patient having a perfect and regular arch is many times greater than the most skillful treatment by filling ever possibly produced. In such cases there is no interruption of the eruptive process of the twelfth year molar, and at the period of the eruption of the dentes sapientiæ, they come far forward of what would have been the case in the event of the non-extraction of the sixth year molars. It must be understood that I do not advise the indiscriminate extraction of these teeth; you may see under what circumstances I do advocate their extraction.

This paper would be useless if the proper period for the extraction of the above teeth were not indicated. When we know that the molars were erupted at or about the sixth year, my rule is to extract not later than the tenth year; if they were erupted as late as the seventh year, I defer their extraction, if possible, until the eleventh year, and seldom later than that date.

One word more. It is claimed by some authorities that of late years a tendency has been observed by them indicating the total suppression of the third molars in the near future. Those who are fearful of that calamity will not view with favor the proposition to extract any of the above-named teeth, and they will undoubtedly continue to fill all such without reference to the future utility of a lesser number of teeth, or the ease and facility with which they may be cared for by patient and operator.—*Trans. of Ill State Dental Society.*

EDITORIAL, ETC.

Mechanical Dentistry Items.—From the transactions of the 1879 meeting of the American Dental Association, lately published, we copy the following items which the discussion on this subject brought forth.

Dr. Stockton, speaking of the advantage of gold plates, remarked:

"I think there is nothing so good for partial plates as gold. For whole plates for the lower jaw continuous gum is the best, while gold for upper sets, fastened with rubber or celluloid, is very desirable. I mention this last because you can thus have a cleaner denture than you can where the teeth are soldered on; although the strongest and best possible work that can be made, in my judgment, is a good gold plate with single teeth soldered on. You can pack rubber in the interstices, and make it clean in that way. When rubber is done away with dentists will be better qualified to practice dentistry as it was practiced years ago. The proper instructions to students are not now given by preceptors, and I think not in colleges, judging from the fact that I see no sets of teeth that are ground up and fitted to the plate as they should be. My practice generally is to take the impression immediately after extraction, and put in a set on celluloid, allowing them to be worn as long as they can be comfortably, and then, if necessary, before the alveolus is absorbed sufficiently for the permanent set, to make them over again. When the time comes I tell my patients that it will be cheaper for them, in health, in comfort and in the pocket, to have a good set of teeth made on gold than on anything else."

Dr. Atkinson alluded to the casting of gold plates as follows:

"There is some experimenting going on with the hope of casting gold plates so as to be perfectly air and moisture tight to the teeth for artificial dentures, something after the manner of the well known cheoplasty of A. A. Blandy of years gone by.

My own impression is that they will, for partial purposes, succeed very well, and I do not know but for entire sets; but I am not so anxious to teach people how to redeem their fellow-men from mischiefs already incurred as to teach them how to avoid the necessity of redemption, to live according to the laws of hygiene, of morality, of fraternity, kindly and honestly, that we may do good by rule, and mischief only by chance and by exception, rather than going on as it is now in artificial dentistry, doing mischief by rule and doing good by chance."

Dr. Essig, alluding to the experiments of the late Dr. James B. Bean, remarked:

"Twelve years ago Dr. Bean, of Baltimore, who was then experimenting with his aluminium plates, told me it would be quite as easy to cast a gold or silver plate as one of aluminium. The specific gravity of gold or silver being so much greater than aluminium, the probabilities were that there would be less difficulty in the metal finding its way into every part of the matrix than was the case with the lighter metal aluminium. Dr. Bean's process was a very beautiful one, and it was very successful as far as the method of making went, but it was one that very few men could accomplish on account of the difficulty of the manipulation and the care that was required. It would be very much easier to swage a plate, and any skillful man who knows anything about that branch of his profession can swage a plate to fit just as perfectly as one made by casting. I see my friend Atkinson shaking his head negatively, but there is one matter that he seems to forget: a plate that is cast must be the size of the plaster model. The plaster model is always larger than the mouth. Every one knows that a plate that is made to fit exactly upon the plaster model must be a little larger than the mouth, and that is an element of trouble at once. A plate should be somewhat smaller than the mouth to compensate for the depression of the capillaries and the change and absorption that takes place along the ridge. By way of illustration, if a plate be made to fit the cast perfectly, and be then introduced into the mouth, it will, in the course of a few days, be found to press a little hard upon the roof of the mouth, and not so hard upon the ridge. That is wrong; it should press in the first place a little unduly along the ridge, and should be a little loose at the palatine arch, for the certainty is that it will in a few days adapt itself to the ridge, while the palatine arch is stable.

That is the result of the experience of everybody, I think, who has watched the matter closely."

Dr. Rehwinkel alluded to a method of overcoming the heating which celluloid and rubber plates occasion in the mouth, by lining the plates with a thin plate of gold. He described the method as follows:

"On the outside there is an attachment with a very narrow strip of platinum twisted up in the shape of a spiral spring and brought out into a coil. It is simply put around the edge, so that the rubber will embrace it and become thoroughly and firmly attached all around the edge. In vulcanite or celluloid the plate is put over the model and pressed into the matrix. You will find that this device will do away with the tendency to sore mouth and remedy the difficulty where a trouble of that kind does exist; at least it has succeeded with me in three very marked cases."

A Valuable New Compound Metal.—Mr. Spence, an Englishman, has invented a compound metal which, if it possesses the properties claimed for it in the paper read a short time since before the British Society of Arts, promises to be brought largely into industrial uses as more applicable to many purposes than the metals now employed therein. This new metal is composed of the sulphides of iron, lead and zinc, which, when melted together in certain proportions, form a homogeneous mass. It is said to possess great tenacity, and not to be subject to oxidization either by the action of air, water or the alkalies. Even the most powerful acids act upon it very slowly, and only when reduced to a fine powder. The melting point of the metal is as low as 310, which gives it, we are told, a remarkable fitness for fine castings, especially such as are required for printing and stereotype purposes. In art work of a higher kind, as in statuettes and ornamental designs reproduced by molding, the superiority is claimed for it that it is susceptible of the highest polish, and that it will take any color, from the dark blue of steel to that of bronze. silver or gold. Its cost, moreover, being but about one-fourth the price of lead, and its perfect freedom from oxidization will render it, in the opinion of the inventor and of the Society of Arts, of peculiar value for water pipes and cisterns, and in the manufacture of acids. It will be known commercially as "Spence's metal."

MONTHLY SUMMARY.

Proof of Death.—Those timid beings who are haunted by apprehensions of being buried alive, and who make testamentary provisions against such a contingency, may now take courage, for science has supplied an infallible means of determining whether or not the vital spark has quitted the mortal frame. Electricity enables us to distinguish with absolute certainty between life and death. For two or three hours after the stoppage of the heart, the whole of the muscles of the body have completely lost their electric excitability. When stimulated by electricity they no longer contract. If, then, when faradism is applied to the muscles of the limbs and trunk, say five or six hours after supposed death, there be no contractile response, it may be certified beyond all doubt that death has taken place, for no faint nor trance nor coma, however deep, can prevent the manifestation of electric muscular contractility. Here there is no possibility of mistake, as there certainly was when the old tests were employed. Muscular contractility, under the faradic stimulus, disappears gradually after death; it is instantly diminished, but is only finally extinguished in about three hours; and hence Dr. Hughes Bennett has suggested that electricity may sometimes be of use in medicolegal investigations, by affording evidence as to the time of death.—*Medical Press and Circular.*

Compressed Nitrous Oxide as an Anæsthetic.—Foreign journals inform us that M. Paul Bert's new method for producing anæsthesia—nitrous oxide used under pressure—has been introduced into the Paris hospitals. Last month, M. Leon Labbe performed seven surgical operations, of which the duration varied from five to thirty-two minutes, in the movable chamber put up at the Lariboisiere Hospital by Dr. Fontaine, for the surgical and medical employment of compressed air. As in the operations already performed at the medico-pneumatic establishment in the Rue Chateaudun by M. Pean, the success of this new anæsthetic method was complete.—*Med. and Surg. Reporter.*

A New Disinfectant.—Dr. John Day, of Geelong, Australia, recommends for use in civil and military hospitals, and also for the purpose of destroying the poison germs of small-pox, scarlet fever, and other infectious diseases, a disinfectant composed of one part of rectified oil of turpentine and seven parts of benzine, with the addition of five drops of oil of verbena to each ounce. Its purifying and disinfecting properties are due to the power which is possessed by each of its ingredients, of absorbing atmospheric oxygen, and converting it into peroxide of hydrogen—a highly active oxidizing agent, and very similar in its nature to ozone. Articles of clothing, furniture, wall paper, carpeting, books, newspapers, letters, etc , may be perfectly saturated with it without receiving the slightest injury; and when it has been once freely applied to any rough or porous surface, its action will be persistent for an almost indefinite period. This may, at any time, be readily shown by pouring a few drops of a solution of iodide of potassium over the material which has been disinfected, where the peroxide of hydrogen which is being continually generated within it will quickly liberate the iodine from its combination with the potassium, and give rise to dark brown stains.—*British Medical Journal.*

Use of Chloroform in Diseases of the Heart.—On this subject M. Vergely, of Bordeaux (*La France Medicale,*) remarks that there is a difference of opinion, some asserting that chloroform is very useful, and others that it does harm in affections of the heart. In M. Vergely's memoir, to which M. Dieulafoy has recently drawn the attention of the Societe Medicale des Hospitaux, three principal points are established. 1.—That the existence of heart disease does not contraindicate the use of anæsthetics. 2.—That chloroform is a sedative in this class of diseases. 3.—That it should be used with discretion. In some cases of severe palpitation chloroform may be successfully administered. Also in some cases of dyspnœa and palpitation arising from mitral insufficiency, either alone or conjointly with hypodermic injections of morphia. M. Vergely has also given it without any accident in angina pectoris, and in certain other affections of the heart characterized by dyspnœa and palpitation. From inquiries he has made into the literature on the subject, he concludes that this agent has been employed too timidly and unsystematically.—*Med. and Surg. Reporter.*

Cement for Mending Hard Rubber.—Fuse together equal parts of gutta-percha and genuine asphaltum; apply hot to the joint, closing the latter immediately with pressure.—*Pharmacist.*

Treatment of Salivary Fistula.—Mr. Henry Morris gives the case of a man wounded in the right cheek, in whom a sinus, whence saliva oozed, remained on the face, and the mouth felt dry on that side. The mucous membrane not being injured, Mr. Morris thought the parotid duct might only be partially severed, and passing a fine catgut bougie into the duct, through the buccal orifice, it appeared at the wound. The proximal part of the duct was then sought for, and the bougie guided into it. The case did well, and Mr. Morris remarked that this method of treating salivary fistula afforded encouraging results by reopening the natural passage, and, if such could not be effected, the duct might be opened into the mouth. If the orifice of the duct, which is its smallest part, was closed, it might be reopened.—Clinical Society, *Lancet.*

Source of Muscular Power.—The theory has been adopted by many physiologists of late years that the muscular system of a fully developed man, or other animal, in health, is merely a perfected mechanical apparatus, which accomplishes work like a machine, not at the expense of its own substance—replacing it by the assimilation of food—but using the food directly, converting it into force without transforming it into muscle. Dr. Flint, however, in a recent work, examines this theory, and gives the results of a series of observations by himself and others, having for their object to test its correctness. After the most careful tests practicable, his conclusions are in opposition to the theory of direct food corversion, and lead him to adhere to the older assumption of muscular waste and repair, the muscles being their own source of power.—*Journal of Materia Medica.*

Precautions in Anæsthesia.—Dr. Chisholm, of Baltimore, has administered chloroform in more than ten thousand cases, without a single serious accident. He always gives a full dose of whiskey before the anæsthetic. Another point he insists on is that in suspending the patient by the feet, we have the very best means of exciting and sustaining the vital organs, by sending blood, the natural stimulus, to the important nerve centres; and that what would be otherwise very alarming symptoms during anæsthesia, well calculated to frighten terribly the inexperienced, soon disappear when the patient is placed in an inverted position. His hospital assistants are so familiar with these death-like appearances, and their simple means of correction, that instead of rushing about wildly for fans, hypodermics, batteries, and what not, they quietly elevate the feet, hanging the head downward, with the chin pushed back, and confidently await restoration; invariably, one or two minutes produces the desired effect, and the operation can be proceeded with—*Med. and Surg. Reporter.*

Mesmeric Anæsthesia.—Willis Francis, colored man, about 25 years of age, had his great toe badly injured by having heavy iron rollers fall upon it. About ten days after the injury he consulted Dr. Legreud, who decided to amputate, and as an experiment, called upon Mr. James Armstrong, of this place, who claims the power of magnetization, to exercise this influence on his patient. The magnetizer commenced by passing his hands slowly and steadily in front of the patient's face for a period of five minutes, when he closed his eyes as though in sleep. The doctor then performed the operation, the patient remaining all the while in a state of complete anæsthesia. By simply snapping his fingers sharply in the patient's face the influence was removed.—*Dr. E. L. Day, in N. O. Med. and Surg. Journal.*

Manufacture of Celluloid—Celluloid is made by dissolving pyroxylin in camphor instead of ether or alcohol. A solution of 1 part of camphor in 8 of alcohol is made; pyroxylin is ground in water, the desired colors added and all water removed from the mixture by pressure; the camphor solution is then added in the proportion of 1 part to 2 parts of pyroxylin, the mixture is stirred and allowed to stand in a closed vessel until the solvent has penetrated all parts, when the mass is expressed and formed into the desired shape by means of a hydraulic press, being heated at the same time from 65° to 130° C, when a solid, uniform piece of celluloid is obtained.—*Pharmacist and Chemist.*

To Check Dental Hemorrhage.—Dr. E. H. Danforth gives these directions in the *Dental Cosmos*—

I keep a piece of the very finest, softest sponge, which I wet, and dry under pressure. In a case of hemorrhage after the extraction of a tooth, I cut off a piece about one-half the size of the crown of the tooth, and having first rubbed the side to be inserted with a little nitrate of silver, I dip it into tannin; then with the point of an instrument press it into the socket, and hold it there until it is saturated. It immediately adheres to the walls of the cavity, and if properly inserted will remain until it needs to be taken out. I have used this treatment over twenty years.

The Effect of Smoking upon the Teeth.—In a paper read by Mr. Hepburn before the Odontological Society of Great Britian it was claimed that smoking was beneficial to the teeth. The alkalinity of the smoke neutralizes any acid secretion there may be in the mouth, and the antiseptic property of the nicotine tends to arrest any putrefactive change in carious cavities. Tobacco will only discolor teeth when there is a crack in or loss of the enamel.—*British Medical Journal.*

Asbestos Powder as a Cement.—Asbestos powder made into a thick paste with the liquid silicate of soda, according to a leading English authority, is stated to be found to be of great advantage for making joints, fitting taps, connecting pipes and filling cracks in retorts. It is said to be of great service in the manufacture of nitric acid, sulphuric acid, and other products, because it can be as easily made as applied, hardens rapidly, and prevents the escape of acid vapors.—*Canadian Pharm. Journal.*

An Anti-Scorbutic.—During the long voyage of Professor Nordenskjold around the north coast of Asia, not a single case of scurvy occurred. This was due to the use of a small red berry that springs out of the ice and snow in the short summer. It is dried, mixed with reindeer's milk, and carried in a frozen state. It has a pleasant, slightly acid taste.—*Brit. Med. Jour.*

The New Anæsthetics—Nitrous oxide and oxygen under pressure, the bichloride of ethidem, and hydrobromic ether, are the new anæsthetics which are now being tested. Hydrobromic ether is the last, and has been used with good results in a number of cases by Drs. Turnbull and Levis, in Philadelphia. —*Med. Record.*

Rubber Cement.—Digest caoutchouc, cut in fine shreds, with about four volumes of naphtha in a well covered vessel for several days. Naphtha should not be used indoors.—*Pharmacist.*

OBITUARY.

At a called meeting of the Dentists, and the "Microscopic Society" of Memphis, Tennessee, the following resolution was passed unanimously:

Resolved, That we announce with great regret the death of Drs. S. P. Cutler and J. C. Harris, of this city, and desire to record our testimony to their sterling worth as men and citizens, whose vast knowledge, ceaseless energies and probity of character were exponents of, and gave dignity to the dental profession; and to convey to their bereaved families the assurance of our most sincere condolence.

J. L. Newborn, *Secretary.*

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ARTICLE I.

[The memorial of Mr. Mehlhardt was presented to the German Emperor and Parliament on the occasion of the Golden Wedding of the Emperor.]

A Few Remarks about the Memorial of Herr Theodore Mehlhardt.

BY DR. W. SACHS, BRESLAU.

[Translated from the *Correspondenz Blatt*, January No., 1880, Page 50.
BY DR. C. H. E. OBERMULLER.]

Mr. Mehlhardt talks in this manner about American dentistry in a very low degree so that those people that are not acquainted with the circumstances, between the real American dentist and Zahntechnicker (persons in Germany who practice but are not recognized by the Government, or by any diploma—translator) are deceived. The standpoint of the author will not be so readily recognized from all good standing dentists and will prove that the old gentleman stands very far behind in dental science in the last thirty years.

Dr. Sachs gives something from Mehlhardt, Page 10. M. says: "We will not hesitate to say that the dental mechanism to Americans has made very important progress.

Through the filling of carious teeth, many people will keep the teeth longer, and maybe useful for mastication. But sorry to say very greater number are uselessly maltreated under great pain and trouble, cheated out of their money, and afterwards the filled teeth have to be, in many cases extracted any way."

About these words will every dentist smile because Mr. Mehlhardt believes the filling of teeth does more damage than good, and Mehlhardt says also that it is American dentists who brought about the filling of teeth into general use. Now on Page 11, we read further: "The Dental instruments are too often in the wrong hands, especially in the hands of dentists who have graduated in America are instruments of martyrdom. And the consequence of this is that all the teeth of the people are ruined."

It is certain that dental instruments in the wrong hands may do immense damage, but why is it just American dentists in whose hand is this damage. I believe that incompetence is an international property, and not confined to American dentists only. Pages 11 to 14, Mehlhardt gives some cases from his practice: "Twelve or thirteen years ago a young lady aged 22 to 25 years came to me who had previously all her teeth and roots extracted by a distinguished American dentist, for the purpose of having artificial teeth inserted. I declined to make her an artificial set because it is against my custom to extract sound teeth and roots, (tight setting.) I told her I was very sorry for the lady but I declined to make her an artificial set and sent her back to the distinguished American dentist who extracted the teeth. Although I know this gentleman has no knowledge about dental surgery, and I could not as man and specialist, send any one to him for treatment; but I told the lady in case she had any trouble I was ready to give her medical treatment, but I would not make the teeth."

Now I (Dr. Sachs,) ask from what knows Mr. Mehlhardt that the extraction of the roots and teeth was not necessary for the condition of the mouth, because when the patients came to him some months were past since the extraction of the teeth. And even in the case the American dentist extracted teeth which ought not to have been extracted, the blame against American dentistry can not be, because in Germany such an American dentist lives and does such malpractice. When Mr. Mehlhardt believes that the wholesale extraction of teeth is taught in American Colleges, he is very much mistaken. It is the principle of every good honest American dentist to preserve to the patient every tooth and root that has any usefulness.

Second case on page 12, Mr. Mehlhardt refers to, seems to be a very hard one, because it is not only a lower set, which is also made by a *distinguished American Dentist*, and did not fit, but particularly Mr. Mehlhardt says that a whole family are ruined by this artificial piece.

Further Mr. Mehlhardt says that American Colleges grant diplomas to young men at 18 years of age. As far as I know American Colleges grant diplomas to those only who have passed their 21st year, and hence the diplomas of this young man must be false. And from the foregoing it is evident that the author has very wrong provocation against American Dentists. When one or more American Dentists are known to him as incompetent and as such men who do not look at a patient to give relief, but only to make as much money out of them as possible, so should he not make that a fault of American Surgery. If Mr. Mehlhardt would take the trouble to make himself acquainted with the practice of other American dentists, he would soon find out that he could learn a good deal from them, and as long as we have not a German Dental College controlled by the State after the suggestions of Dr. G. Wm. Laindorff, (*Viertellyapropyoft*, 1877, page 436.) I would advise every young man who wanted to study dentistry to go to America after he has finished his studies in the German University. There he finds what we need here—Dental Colleges, who give all those men who want to learn all that is necessary to become competent dentists who stand the height of their profession. I do not intend to say that nobody can become here a good dentist, but he must seek a chance in his education, while in America he can seek it in full. So much for American Dentists.

Mr. Mehlhardt discovered that better teeth the people have, the better they can pay the taxes. Mr. Mehlhardt says on page 8: "To-day there are a good deal of remedies to give relief from tooth-ache, all with success. But as experience teaches, it has been, and will be nothing but trying by which the pain mostly increases and at least there is no other way when the inflammation has come to its highest state, by neglect or false treatment to relieve but by extracting the tooth."

Again on page 15, Mr. Mehlhardt says: "It has always been a mistake to extract the peoples' teeth, on account of tooth-ache, because every tooth can be cured without extraction of the tooth, especially when the patient right away after feeling the pain, seeks relief from a competent educated dentist." I ask here: How will Mr. Mehlhardt explain this.

On page 8, Mr. Mehlhardt says: "At the commencement of this century, the carious teeth were a great deal more numerous. Of 100 people at the age of 40; 50 per cent. had a useful set of teeth. Now only 10 per cent. of that number have a useful set. Already at the age of 30, 9-10ths of the present generation are teeth patients, and of this we can judge from good authority that the next generation will wear in their 30th year, mostly artificial teeth. In other words, *are cripples as regard digestion*, if dentists keep up their present system."

So rapid have carious teeth not progressed, as Mr. Mehlhardt says. On the contrary I say that in the last 25 years, less teeth are lost than in previous years. The public is kept informed by good dentists about the mouth and how to preserve the teeth, so the next generation will not be "cripples in digestion" if the present system is carried on, but will have better teeth. Because from their youth they will be taught to preserve them and by themselves, contribute to their preservation.

Mr. Mehlhardt believes that the filling of temporary teeth is not only useless but absolutely dangerous. So they taught 30 years ago, but to-day every competent dentist seeks to preserve the teeth of the little ones, in order to spare them pain, and in order to preserve the temporary teeth until the permanent ones are ready to come through.

Mr. Mehlhardt would do the suffering humanity invaluable service if he would tell us the method by which he fills carious teeth exactly painless to the patient; and in which way he treats every toothache without extracting the tooth.

There is a good deal said in this important paper (?) of Mr. Mehlhardt, which has been written by a gentleman who has enjoyed a very large practice of 30 years. But I believe that hardly all that is said in this paper will be of any benefit to suffering humanity.

ARTICLE II.

What Advantages the American Colleges of Dentistry afford the Students and afflicted Public.

A DISPUTATION BY DR. F. W. RUDOLPH, HAMBURG, GERMANY.

I.—DENTAL SURGERY IN GERMANY.

The time has not long passed, when Dental Surgery and the Dental Profession generally was looked upon as the step-child of the sciences. By and by in Germany, men of influence succeeded in securing for it its recognition as a branch of medicine, and on the part of the German government, a chair of Dental Surgery was established in some of the German Universities, and only one dentist appointed to lecture on this branch.

Of all the German Universities, only five have a chair for Dental Surgery, with one Docent each. So little is this important branch recognized that a small number of Dental Students attend.

In the whole German Empire, only six Dental Students graduated in the year 1879. The system of educating the German dentists has been of a very different kind. Before 1872, it may not be improper to state, that most everybody, who had a little preliminary education and attended to a few lectures, was admitted to a very simple dental examination of the State board, and when passed, was given the right to practice as a dentist. After this time, legislation in Germany elevated dentistry to a branch of medicine, and all those men with their very doubtful education who were in practice then, wanted to be recognized as members of the medical profession. Now every young man, who wants to study dentistry can only matriculate on the Universities when he has passed the first class (prima) of a High School, and then, he has to study for two courses before he is admitted to examination. At the university, he is compelled to hear every day for one hour, a lecture from the Dental Docent, and finally if one point is missing from the expected standard he will not be passed. This method of education is called by men of authority a very defective one.

The dentists took generally intelligent young men as apprentices in their laboratories, who stayed with them for three years, and then became Mechanical Dentists because they were not admitted to the State examinations. But, however, those who were able, went to America and studied Dental Surgery at the American Dental Colleges, with their Museums, Infirmaries, Laboratories, &c., and their excellent professors, and then came back to Germany as a perfect and competent dentist. But sorry to say, those graduated dentists in Germany are not disposed to recognize the American Doctors of Dental Surgery (this title though is recognized by the German Government when legal,) as their brethren and fellow-men, not as co-operators for the benefit of the suffering humanity, or representatives of the Dental profession, although the American Dentists do not pay much attention to this. With what disregard the German Dentist looks down on the American proves the memorial of Mr.

Mehlhardt, dentist, of Halberstadt, Germany, of which I have more to say afterwards.

In this memorial there is nothing said about the imperfect dental education in Germany, although a German Dental College is pleaded for, in it. The latter is just the thing that Germany needs, a chance to study, like America offers. Good dental professors and students will come in numerously. The six graduated dentists can not save the teeth of the suffering humanity, and as long as no good Dental College exists in Germany, whoever is able to do so, goes to America.

II.—DENTAL SURGERY IN ENGLAND.

Dental Science has a very important place in England. There are in London two excellent institutions, after the American model for the education of dental students. In the future, everybody who wants to practice dentistry must procure previously the degree of Licentiate of Dental Surgery at the College, but also the American dentists are highly respected in England, and their offices are very much frequented by the public.

England pays close attention to all transactions and improvements in dentistry in America. This is another reason why America is looked upon as the mother of dentistry, and we don't need to agree with Mr. Mehlhardt when he says: "If young America has made the mistake, to allow everybody the practice of the healing arts, so this is to excuse as a mistake of youth." How generous!

III.—DENTAL SCIENCE IN AMERICA.

The celebration of the golden wedding of his majesty the Emperor of Germany, gave occasion to Mr. Mehlhardt, dentist, of Halberstadt, Germany, to publish the already mentioned memorial and to dedicate it to the Emperor. In those pages, Mr. Mehlhardt uses very contemptible language about the American Dentists, and the American Colleges, thinking that only he is infallible, and considers a great number of his Colleagues as quacks and charlatans.

Besides other things, Mr. Mehlhardt asserts, that not the whole science of dentistry but only mechanical dentistry is taught at the American Colleges.

I have not only seen American dentists engaged at the operating chair, but have also heard scientific lectures from them, and must assert, that they have a better dental education than the greater number of German dentists can boast of. Concerning mechanical dentistry the Americans can not be beaten, and nobody will blame the public, when they seek the American dentists.

I have in my possession several of the catalogues and announcements of some of the best American Dental Colleges. For instance, Baltimore, her distinguished College, founded in 1839, a blessing for the dental student and suffering humanity. The dean of this College is one of the best Professors of Dental Pathology and Therapeutics in America, Professor Ferd. J. S. Gorgas, together with a faculty of five more distinguished Professors for Anatomy, Physiology, Chemistry, &c., &c., and excellent Demonstrators. The Baltimore Dental College has graduated already 881 Doctors of Dental Surgery, who are practicing all over the world, for the welfare of their patients.

But only Mr. Mehlhardt might cry about this, and despair. Why? Because this old gentleman believes that no American dentist is so competent and skilful as himself.

Furthermore, New York has an excellent dental College, of which Dr. Abbot is dean; also Boston, Philadelphia, &c. all of which are blessings to the world, and we only wonder, why Mr. Mehlhardt speaks with such absolute disregard about these institutions, and is not disposed to acknowledge anything that America has done for dentistry. Intelligent German dentists send their sons to America to study dentistry, and there to finish their education, and we only wish to have a like institution here in Germany. Because the first Medical authorities in Germany have stated that the present system of teaching dental students in Germany is a very defective one, and intelligent men always prefer the American Colleges.

These Colleges give the student all advantages to become perfect in his profession. They are equipped with museums, infirmaries, laboratories, &c., and their professors are men of the greatest ability in their chairs. The infirmaries are crowded with patients every day, and there the student can enjoy practice in full, and poor people are treated free of charge. We hope the time is not far distant when we will have in Germany an institution like them.

Mr. Mehlhardt says that he has enjoyed a large practice for thirty years. What was the state of dental surgery thirty years ago? What faculties; what chance for dental education; what dental literature, were then present? Certainly very insufficient ones. What immense progress is made during this time, and America is always ahead with its inventions and improvements.

What has Mr. Mehlhardt done in this 30 years for the progress of dentistry? He says the Medical Science, respecting dental surgery in America, is nothing but a system of swindling the public of their money. Further he says every toothache can be cured without the extraction of the tooth; all filling ought to be done free from any pain whatever to the patient. But how to do it, Mr. Mehlhardt keeps secret in his infallibility, but an American dentist would not hesitate to make such important discoveries known for the benefit of the suffering humanity. Thank them for it! That is true benevolence! That only is true help. Let us bring the American Colleges and their representatives a *Creseant! Vivant! Floreant!* May Germany have soon such an institution there.

[This article is dedicated most respectfully to F. J. S. Gorgas, A. M., M. D., D. D. S., Director of the College for Dentistry in Baltimore, by the author.]

ARTICLE III.

Alveolar Abscess.

BY M. F. FINLEY, D. D. S.

[Read before the Michigan State Dental Association, 1879.]

Mr. President and Gentlemen:—I have chosen for a theme alveolar abscess. This has been, and no doubt will ever be, a source of great annoyance to the practitioner as well as to the patient; on account of the unwillingness of the patient to submit to a proper and systematic course of treatment, which oftentimes becomes odious unless he stops to consider the results of the disease if left to follow its course, as compared with the widely different issue of the case if properly and successfully managed. And also on account of the persistent course of treatment required in the majority of cases which present themselves; and the amount of suffering and inconvenience this disease causes the patient. It is also a great incentive to become proficient in the management of this disease, because of its difficulties and the bearing it has upon the comforts of humanity.

The proximate cause of alveolar abscess is destructive inflammation of the periosteum, or more explicitly, inflammation of the investing membrane of the tooth of sufficient duration and severity to result in checking life-action in the tissue. It then undergoes solution, and the nutrient material brought into the diseased territory is for the most part vitiated and is added to the accumulating debris.

This cause has its origin in others more remote, always occurring subsequent to, and in the vast majority of cases resulting from the death of the pulp. Also from dead and degenerating teeth, mechanical violence, as blows on the teeth, accidental or otherwise; the too rapid forcing of the teeth apart; sudden and extreme thermal changes; the presence of fillings forced through the root of a tooth; and in a great many cases where undue pressure is exerted upon an exposed pulp.

The course of the disease, from its incipient stages, I will try to describe in a brief form.

The presence of the irritating cause produces at first a slight determination of blood to the part and an increased flow through the vessels, causing distension of the capillaries; reaction then takes place in these, resulting in stasis of blood, and exudation begins. But the irritating cause still exerting its influence, the increased flow of blood is kept up, producing a slight sense of fullness, which invites contact, and even pressure, from the opposing teeth, causing a rather pleasurable sensation and seeming relief.

As a consequence of the partial stasis and increased flow of blood, the surroundings precluding free expansion of the capillaries and other small vessels ramifying this membrane, these structures are pressed upon proportionally to the force of the determination of blood to the part.

This excessive pressure results in free exudation, and also in rupturing the overstrained capillaries, and the consequent outpouring of the various constituents of the blood.

Quite perceptible elongation of these teeth occur, becoming more apparent as the inflammatory process continues.

Also more or less swelling of the soft parts adjacent appears as a constant symptom. Excessive pain is experienced upon the application of pressure or percussion, and sometimes even the slightest touch is intolerable. There being a continuous, deep, dull and throbbing pain.

Structural changes are taking place and the quality of the blood is altered; suppuration is in progress.

What is termed the sac, and by some the pus-secreting sac, is formed from the vitiated blood, and is no more or less than a mass of coagulated lymph.

The alveolus is absorbed from the undue pressure, and the structural changes which are occurring; formation of pus increases until an outlet is effected for its escape.

Quite a variation exists in the character of the discharge from alveolar abscess in different cases, and at different stages of the same case. Sometimes consisting of pure or laudable pus, but generally it presents less the character of pus and is a vitiated, ichorous fluid. It being modified by the systemic condition, by the tissue disintegrated, and by the character of the local irritants.

The size of the abscess cavity varies, owing to the severity of the disease and the peculiar susceptibility of the parts.

Sometimes the cavity enlarges after the pus has escaped, though generally it reaches its full size before that time.

The pus being left to force for itself an avenue of escape, the discharge occurs in various directions, and at variable distances from the point of secretion.

At times it occurs through the root, or between the tooth and alveolus, at other times directly through the alveolus and gum.

Occasionally the abscess is formed within the antrum, when the root of the tooth nearly or quite perforates the floor of that cavity and becomes complicated by involving its lining membrane. When this is the case the disease is difficult to treat, and frequently necessitates extraction of the offending member. Oftentimes the fistulous opening is at some considerable distance from the seat of the difficulty, though always following some natural avenue, which furnishes the least resistance to the outward progress of the pent-up matter.

Alveolar abscess is exceedingly variable in character, owing to the constitutional idiosyncrasy of the patient, the condition of the surrounding parts and the exciting cause.

Patients of a manifest inflammatory diathesis are much more subject to abscess, or those in whom there is considerable local inflammation from some local exciting cause.

Sometimes after the formation of an abscess, when there is a discharge of healthy pus, nature, unaided, may effect a cure; but in constitutions of a cachetic diathesis, the discharge is very apt to continue and is of a purulent, acrid character.

Often quite serious consequences follow neglect of these cases, as necrosis of the roots of teeth and portions of maxilla, and disease of the antrum; bad breath, dyspepsia, neuralgia and the like, being frequent concomitants of the disease.

Treatment.—Obtaining a minute history of the case, and making a thorough inspection, not only of the affected organ and its surroundings, but of the general appearance of the patient, and determining his constitutional peculiarities, will aid greatly in making a proper diagnosis and instituting a systematic course of treatment.

In cases of threatened abscess the indications are for removal of the cause of irritation and general antiphlogistic treatment.

When the abscess is of recent origin a cure can much more readily be effected than in one of long standing.

The first step in chronic, as in acute cases, will be to evacuate the pus cavity and the root canal of their contents, enlarging the latter to the apex of the root, and thoroughly cleanse these, applying disinfectants.

The object of the local treatment being to break up and destroy the accumulated lymph mass.

This is accomplished either by therapeutical or surgical means, or by the two combined.

If therapeutic treatment alone is employed, the agent to be used is introduced through the apex of the root to the seat of the disease. In order to break up an abscess by an operation, it must be easy of access, and scarcely ever can it be performed through the root.

But in the great majority of cases where the discharge is through the root, therapeutic treatment alone will suffice.

In accessible cases an opening can be made through the gum opposite the point of the root, either by stopping up the root and causing the pus to force an opening, or by making an incision with a sharp-pointed bistoury, and thus at once reaching the seat of the disease. When there is already an opening through the alveolus and gum, the canal should be sufficiently enlarged to admit of free use of the instrument in dissecting the lymph mass from the point of the root, removing it as completely as possible.

If the case is a favorable one, nature alone will restore the part to health. But generally therapeutic treatment will be required to assist in the work.

The agent to be used should be forced through the apex of the root, and, if possible, out at the opening in the gum. A pledget of cotton should be kept in the fistulous opening to allow of free drainage, and thus favor healing from the bottom. These applications should be repeated every day or two until the discharge ceases.

Abscess of the inferior maxilla is much more difficult to treat from a want of free egress for the secretion, and in many of these cases the removal of the tooth seems to be indicated.

And even in many cases of the upper maxilla, the most prompt and efficient treatment consists in the operation of replantation.

In performing this, the tooth should be carefully extracted to avoid injury to the tooth, fracture of the alveolus or laceration of the gums; then remove from the root or roots all the diseased periosteum and coagulated lymph; also the end of the root should be excised and rounded.

The cavity of decay, the pulp chamber and root canal should be thoroughly cleansed, formed and permanently filled. Upon the removal of the tooth a pledget of cotton should be placed in the socket, either moistened with some preparation to prevent, to a certain extent, coagulation of the blood, while working at the tooth; or allow the blood to coagulate in the socket and remove the cotton and coagulum just before replacing the tooth.

It now being ready for insertion, the socket is to be cleansed of the clots of blood, and all that does not properly belong there. Then carefully replace the tooth, allow the jaws to be closed which will carry it to its precise position, and apply stays or ligatures if necessary. Usually the tooth will become firmly attached in a few days.—*Missouri Dental Journal.*

ARTICLE IV.

Proper Management of Proximate, Cutting and Grinding Surfaces of the Teeth.

By Dr. Geo. B. McDonald.

In consideration of failures in our attempts to stay the ravages of caries in the proximate surfaces of the human teeth, I have decided to devote this paper to the showing of the causes of failures, with a view of refilling cavities on such principles as to guard the fillings from failure in the future. As the cutting and grinding surfaces of the teeth are often involved with the proximate ones, I deem it proper to include them in the few remarks I shall make upon this subject.

It will be sufficient for my present purpose to describe the proper preparation and filling of the proximate surfaces of a right-upper central incisor and right-superior first bicuspid, where the cutting surface of one and the masticating surface of the other are involved, they having been previously filled and now requiring to be refilled. Before giving a description of such an operation as should be performed upon the central incisor referred to, let us first ascertain the cause or causes of the failure of the fillings previously introduced. If we succeed in finding this we shall undoubtedly be able to see our way clear to successfully fill this tooth, so that the operation cannot fail again. After a careful examination of the tooth in question we arrive at the following conclusions: *First*, We did not have room enough, laterally, to fill the tooth properly, as we wedged the same day we filled it, when we should have pressed it and the adjoining tooth apart for one week or more, as circumstances might indicate. *Second*, We did not properly anchor our filling in the cervical, palatal and labial walls of the tooth. *Third*, We did not bevel the margins of the cavity thoroughly, especially at the cervical margins, leaving a frail and partially disintegrated structure, which continued to disintegrate after the fillings were inserted. *Fourth*, We packed our gold at the cutting edge in enamel, which shows that there were checks in the cutting edge of the tooth, and these checks caused the cutting edge to split off when exposed to the forces used in biting hard substances. *Fifth*, We discover that too large pieces of gold were used, and not perfectly impacted. Only one hour was spent on them with an automatic or hand mallet, when, to make a perfect operation, we should have spent a much longer time, even with the use of the electro-magnetic mallet, in impacting small pieces of gold foil into the cavity. *Sixth*, The gold was not finished down perfectly even, especially at the cervical margin, thereby allowing lodgments of destructive agents along the margin of the filling which caused disintegration of the enamel. These are six good and satisfactory reasons why our fillings failed, any one of which was sufficient.

With the knowledge gained in ascertaining why we failed, we will proceed to refill this tooth, with the intention of preserving it for twenty years or more. Having wedged it apart from the adjoining teeth from one-sixteenth to one-eighth of an inch, and having kept it in this position one week or longer, or until all soreness that has been induced in the peridental membrane by the wedging shall have subsided, we now apply the rubber dam; and, taking a proper shaped corundum wheel, cut away that portion of the cutting edge of the tooth yet remaining between the cavity in the mesial and the one in the distal proximate surface more or less, as the case may require. Now, with proper shaped stone-cut engine burrs, we make retaining grooves through the cutting edge of the tooth, extending them to cervical, palatine and labial walls. With bud-shaped enamel burrs we bevel or properly shape the entire orifice of the now compound cavity, removing every particle of disintegrated tissue, and with a strip of No. 0 emery cloth polish off the external margins. With the hot-air syringe we blow out the chips that may be in the cavity and pronounce it ready for the gold. Now take one sheet of cohesive gold foil (No. 4,) fold it four times with a nickel-plated spatula, and with a pair of foil shears cut into strips one-sixteenth and one-eighth inches wide; take a strip of the narrow gold, anneal it slightly, and with a properly-pointed hand instrument anchor it instarting points made along the cervical wall of the cavity. Now with the electro-magnetic mallet we proceed slowly, surely and perfectly to pack these small pieces of gold foil against the walls until we have restored the tooth to its original contour with solid gold, perfectly uniform in density from center to circumference, which will stand the force of incising food like cast steel, and cannot possibly be dislodged from its position without the breaking of the tooth at or near the neck. We now finish this filling with properly shaped separating saws, files and strips of emery cloth till it is ready to polish. The polishing is effected by the use of strips of crocus cloth and whiting on linen tape, with the assistance of the dental engine, flexible rubber cones and wheels.

On an examination of the right-upper bicuspid, which has previously been filled on its mesial and distal proximate surfaces, we find the filling partially out and the structure extensively decayed around the fillings, which would fall out were it not for the adjoining teeth. We find all the causes of failure that were present in the case of the incisor with two additional ones, namely: We left an organic fissure on the grinding surface of the tooth, which should have been opened into with a small, thin corundum wheel and the two proximate cavities connected. We also find, upon an examination of the gold, that we had used too large pieces in filling, as cylinders, pellets and ropes of gold foil twisted up with our fingers. On taking the filling apart the gold separated easily, and each filling is made up of different large pieces of gold pressed loosely against each other, there being no cohesion of the gold—the condition that must exist in order to get the best results.

After wedging this tooth the same as the incisor, we apply the rubber dam and proceed to prepare for filling. When nearly ready we have a compound cavity presented, extending from the cervical wall of the mesial surface through the fissure to the cervical margin of the distal surface. We find that the walls of the tooth left standing are partially separated from each other, and that they are so attenuated that if left standing they will be likely to break off. We are more certain that this might occur when we notice that each cusp is quite long, its antagonist having long cusps also. Our past experience has taught us, with this condition of things one or both of the cusps may be split off by the occlusion of the inferior teeth; so we cut off the cusps, using corundum wheels of suitable form. After removing all the decayed portion we make starting points in the cervical walls and anchoring grooves along the palatine and buccal walls with a small stone-cut burr, having previously finished the entire margin of the cavity with a fine, sharp, bud-shaped burr, being sure not to leave a particle of disintegrated enamel at the orifice, where the gold and tooth tissue will be in contact and exposed to destructive agents. We proceed to fill, as before, by packing narrow, thin strips of gold into the starting points with a proper-shaped hand plugger, completing the operation with the electro-magnetic mallet, being sure to condense each piece thoroughly against the enamel and throughout the entire filling until we have restored the contour of the tooth, thereby making a gold crown with such gold cusps as can no more be split by the occlusion of the inferior teeth than could a crown of steel. Having finished this operation as we did the incisor, it is absolutely necessary that the adjoining teeth should knuckle up to the gold one, so as to come into perfect contact, to prevent food from getting between the teeth, thereby irritating the gums, as is so often the case where V-shaped separations are made between them. If we have spent several hours on these operations, and have charged thirty or fifty dollars each for them, it will be infinitely better and cheaper for the patient than any other method.

I will here give a simple illustration of the principles involved in the method of operating which I have just given. If a barrel were hooped with common twine it would be a very weak vessel, and the staves would separate when but little force was brought against them. When a barrel is hooped with iron the staves become a unit, as it were. Such a barrel can withstand tons of mechanical force without being broken. The ordinary method of filling frail and extensively decayed teeth with cylinders, pellets and ropes of gold foil twisted up with the fingers and packed with automatic or hand mallet is to be compared to the twine-hooped barrel, while the process I have heretofore described is to be compared to the barrel with the iron hoops. A tooth restored according to the method I describe will stand any necessary force without being split apart, because the enamel is supported by a solid band or hoop of gold as strong as steel. There are those who argue against cutting away too much tooth-structure. I assert, without fear of successful contradiction, that there are ten failures for the want of cutting away enough frail tooth-structure, to be replaced with rolled gold, where there is one from too much cutting.

"Haste makes waste," is an old maxim, and in nothing can it be better illustrated than when performing operations on the natural teeth. Hasty work is usually very imperfect, while operations upon which sufficient time is spent are more likely to be successful. I will here say that the value of clinics, to illustrate at our meetings that which relates to operative dentistry, cannot be over-estimated. Finally, I would say that if we practice in accordance with the principles herein stated our efforts will usually be crowned with success, and the teeth of our patients saved and restored to their former usefulness for many years.—*Trans. American Dental Association.*

ARTICLE V.

Dental Caries.

BY DR. LOUIS R. EBERT, OF RIO DE JANERIO.

The destruction of tooth substance is attributed to acids and leptothrix by Magitot, Leber and Rottenstein, etc. There are authors who also attribute dental caries to an animated cause, producing to teeth and organs necessary to health, sad ravage and pain. Now, the true cause of dental caries not having been as yet thoroughly elucidated, becomes to all interested a subject of minute observation and close study. Having lately devoted much time to serious research in this direction, we find ourself more and more confirmed in the belief that there exists *in certain cases of caries* an animated agent, microscopic in size, and having mandibles.

There is a special species attacking the necks of the incisors, eye teeth, bicuspids, and sometimes, but very seldom, in the lower jaw. This latter decay is certainly caused by an acid coming from either the secretions of the mucous membrane or the parotid glands, having no cororation, and the caried part bears exact resemblance to that placed in a tooth in acids; the march of the decay proceeding internally as well as superficially, having a regular border and entirely free tooth particles.

The point of attack for caries, to whose cause we attribute an animated organ, is first perceptible by a small dark point in the slight hollow on the labial surface of the molars in the interstices of their grinding surface as well as those of the bicuspids, in the marked groove of the upper incisors on the palatine surface; between the teeth, where food remains lodged, and which, in the stage of fermentation and decomposition does not produce enough of acid, but certainly enough of vibrions, etc., to produce damage, while seldom if ever will decay begin on the lingual surface of the lower maxillary, while sometimes the second molar of the upper jaw will have the point of commencement on the palatine surface, which proves clearly that acids are not exclusively the cause. The liquids of the mouth cannot find a spot of attachment, because kept in constant circulation by the natural movement of the tongue, muscles and cheeks..

It remains yet for the microscope of superior power to the one employed by Leber and Rottenstein to prove that his leptothrix are but adjuncts instead of causes of dental caries.

The opinion expressed by Raspail on dental caries is far from being exaggerated in that which concerns their cause, formation and aspect, and comes in to justify our preceding assertions in regard to caries of the molars and bicuspids, showing clearly to the observer its point of attack where the tongue cannot reach it and where it cannot be crushed by the antagonizing teeth in the labor of mastication; then quietly and safely proceeding in its work of destruction, fully protected, it perforates internally in the direction of the nerve, hollowing out the tooth, leaving untouched the walls of enamel that by accident and mastication crumble down, displaying to the surprise of the owner an immense cavity that had been forming without attracting his attention in the slightest degree. Daily do patients call on us expressing surprise at a tooth having been crushed in or at one which all of a sudden gives them intense pain.

As regards the small worms, of which Scribnus Largus treats, and which seemed to have been seen by Bremer and Brera in the saliva expectorated by persons suffering from odontalagia and in those to whom they gave narcotic plants to inhale, they are probably the same of which Ficinus speaks, who attributes dental caries to a putrefaction produced by small infusori living in the mouth and found in large numbers in the tartar that covers the teeth. It is more probable, we think, that these infusoria and vibrons have nothing to do with caries, but help to form the salivary calculus that, according to Mandl, is composed of calculary carapaces.

According to observations that we have made, the destructive agent makes its way internally at the points of which we have already spoken. Nature furnishes us analogous instances of work by a certain class of mollusks that perforate the hardest of rocks, either by a corrosive or perforating power. As to the disappearance of the calcarious salts of which some authors speak, we again find like agents in nature, not only plants but sea animals, which make it their nutritive element. It may be that this agent, when once in the pulp chamber, extracts voraciously the juices needful for his sustenance, and causes odontalagia, which those suffering from it often describe as something gnawing and biting the nerve.

Before the work of destruction has gone far, the cavity is found full of small microscopic particles, which clearly show that they have been detached, and fall on the tongue or napkin in a perfectly dry state. This would be otherwise if they were produced by acids. These particles are not produced by the excavator nor bur, and certainly no work of disorganization can produce them.

There arrives a stage in the disease, however, as we have already observed, when the walls of the tooth, partially or entirely hollowed out, break in, giving full ingress to the fluids of the mouth, and then the acids play an active part, aiding frightfully in the work of destruction and changing the aspect of the cavity.

Van Beneden tells us clearly in his work, "Commensaux et Parasites," that neither the brain, ear, eye, heart, blood, lungs, nor the spinal marrow, nor the nerves, nor the muscles, not even the bones are exempt from attacks of parasites.

Now, could the teeth be the only organ in the human frame excepted from the attack of parasites? Certainly not; for, by their mere form, position and contact with parasite forming agents they are more subject than any other organs. At different times examinations have been made, by men in the profession, on caries produced on teeth placed in jars in which were liquids and substances that produced caries similar to those found in the mouth. We cannot accept these results as conclusive, for a tooth thus exposed is not in its normal state and cannot offer the same points of observation; nor can it be compared to a tooth placed with its companions in the oral cavity, constantly subjected to sudden thermal changes, constantly in contact with liquids more or less charged with acid or animal life, having a living nerve-giving life, by means of the analculi, and which may, by the mere supply of poor or vitiated blood, transmit but feeble elements for its strength, thus offering less resistance to the attacking agent. Persons having soft teeth have them far more decayed than persons of sound, hard teeth, having the same elements and liquids for food and drink.

The observations on dental caries must be made *seance tenante* or immediately after extraction, which operation, fortunately for the patient, is only resorted to when the tooth is all destroyed or too far gone for the minute research so necessary in the first stage of its destruction.

We are often very much surprised at the rapidity of decay in some teeth while other teeth in the same mouth remain intact. Why is this? Are they not continually bathed by the same secretions, subject to the same thermal changes? And if the cause of decay be acid, not one but all the teeth would be more or less attacked.

Science having clearly proved that nearly all our organs are subject to the attacks of parasites, we are more and more convinced that the teeth are not exceptions, especially as we have, in our late researches, found what appears to be the destructive agent lodged in the cavities, of which we have made mention.

But one cannot continue this subject, on which so much has been said and so much labor expended, without the presentation of unrefutable results, without more perfect instruments.—*Dental Miscellany.*

ARTICLE VI.

Necrosis.

BY H. H. TOWNSEND, PONTIAC, ILL.

On Saturday, September 7th, 1878, Mrs. R., about forty years of age, acting as a commercial traveler, came to consult me in regard to what she called an "ulcerated tooth." I was at once impressed with her feeble and emaciated look, which very much resembled a patient well advanced in consumption. The red blood corpuscles seemed sadly deficient. Pulse feeble and very frequent, something over 100. The history of the case, as nearly as I could get it, was, that some two months previous, she had had some teeth filled with Amalgam, and shortly afterwards began to notice a coppery taste in her mouth, smarting of the throat and fauces, soreness of all the teeth, and increased flow of saliva—the symptoms increasing in severity until profuse salivation ensued. This lasted some days, and after it subsided an abscess broke over the labial surface of the right superior cuspid root. Her dentist called it a case of "ulcerated tooth," and singularly enough, treated it through the fistula some six or seven weeks without removing the filling to ascertain the condition of the pulp. When I saw the case there were several fistulous openings discharging thick yellow pus. On examination with a probe I found the outer alveolar plate necrosed from near the first bicuspid nearly to the lateral incisor, and extending upward about one-fourth inch beyond the apex of the cuspid root.

Exfoliation had already taken place, and a few incisions through the gum with a lance, enabled me to remove the sequestrum with very little difficulty. The hemorrhage was slight, requiring no treatment. The wound was syringed with tepid water containing about four drops of creasote and one grain of morphine to the ounce. As the inflammation had extended laterally to the first molar on the right side and to the first bicuspid on the left, and the patient being in such an anæmic condition, I was apprehensive that the necrosis would also extend and result in the loss of, perhaps, the entire jaw. I therefore painted the gums as far as inflamed, with tr. aconite root and tr. iodine, equal parts, with a view of allaying the inflammation and if possible preventing any further spread of the disease.

Prescribed a tonic of quinine and iron, as follows: Tr. muriate of iron, 1 oz.; sulphate of quinine, 1 dram; water to make 4 oz.; teaspoonful in water three times a day. Also wine and egg before breakfast; rare beef-steak, graham, and fruit; recommended as a diet also milk and egg. I removed the filling from the cuspid and found that the pulp had never been exposed, and was alive and probably in a healthy condition. I determined if possible to save this tooth, notwithstanding it had no bony covering on its labial surface. The cavity was filled temporarily with gutta-percha, and the patient dismissed at 12 M., with instructions to call again at 6 P. M. Came promptly on time. Syringed as before, and repeated the application of aconite and iodine. Saw the patient again Sunday morning. Had slept well and was much refreshed. Color improving. Pulse 80 and stronger. Inflammation of the gums subsiding. Discharge of pus considerably diminished. Treated as before, and repeated it again Sunday evening.

Monday morning found considerable improvement in every respect. Syringed with an alcoholic solution of salicylic acid in water. Applied the aconite and iodine as before, and repeated the treatment again at 4 P. M., as she was on her way to the train to leave town. The improvement was all that could possibly be expected in so short a time. Pulse strong and natural. Very little discharge of pus, and the inflammation of the gums very much reduced. As her business took her to Peoria, Ill., I sent her to my friend, Dr. J. M. Hunt, of that city, giving her a letter of introduction, containing a brief history of the case and my treatment. Some two weeks later I received a letter from

Dr. Hunt, stating that he had continued the treatment except the application of the aconite and iodine, which he had discontinued a few days previous, as it was no longer needed. Reported the case doing finely. The deposit of new bone being quite perceptible. How long she remained there I do not now remember, but after leaving Peoria she syringed it herself, using the salicylic acid water for the purpose. Saw the patient again the next April, and found the reproduction of bone had been complete, except at a point just above the termination of the enamel on the labial surface of the cuspid, where the gum had receded, leaving a little notch in the gum. In December, 1879, I removed the gutta-percha filling from the cuspid and re-filled with gold. The pulp was alive and healthy, and the tooth as firm in its socket and as useful as any of its neighbors.

Now, as to the cause of the necrosis. My own opinion is, that the periostitis accompanying the salivation was the exciting cause, the debilitated condition of the patient tending to an unfavorable termination. What produced the salivation is not so clear. As it occured soon after the introduction of some amalgam fillings, without the use of the rubber dam, and as the patient declared that she had taken no medicine whatever, I thought perhaps some particles of the filling had been swallowed, containing sufficient mercury to salivate. My theory of this however was somewhat shaken by learning of a case of salivation following the insertion of an amalgam filling in my own practice. On the 24th of August, 1878, I filled a mesial cavity in a right superior second molar, for a farmer in good health. The cavity was a simple one, not extending to the grinding surface. The first molar was missing, affording easy access to the cavity, which was prepared, filled and finished with the rubber dam on the tooth. The amalgam used was one of the gold and platinum alloys in the market, and was used as dry as it could be worked, and tin foil pressed upon the surface of the plug, to absorb any surplus mercury that might remain. The filling was burnished before the dam was removed, and I *know positively* that not one particle of the filling was swallowed. Yet, in a few weeks, the patient returned, complaining that he had been badly salivated soon after his tooth was filled. I examined the filling carefully, and found it in perfect condition. Also questioned the patient closely, and he insisted that he had taken no medicine of any kind. I have no theories to offer. Since writing the above, I have received a statement from Dr. Hunt of his treatment of the case of necrosis, its condition, progress, &c., which I append, as follows:

Mrs. M. H. R. came to my office in September, 1878, upon recommendation of Dr. H. H. Townsend, of Pontiac. Upon examination of the right superior lateral incisor, cuspid, and first bicuspid, I found the incisor and bicuspid slightly loose, but the cuspid was in a much worse condition, being affected by a lesion of the gum tissue on the mesial side, presenting an opening about half an inch deep, by about an eighth of an inch in diameter at the orifice, extending alongside the root toward the apex. The mucous membrane over the adjacent teeth presented a healthy hue, but over the cuspid, an appearance slightly purple, as though nature was timid in her expression of an effort she was being urged to make in a recovery of the gum tissue to a physiological condition. There was an appearance of partial recovery from necrosis, leaving a deep, well-defined sinus, with a constant, slightly appreciable deposit of granulations at its apex. The objects had been to prevent a union of the lips of the orifice, next to invite continued granulations of the deepest portion of the sinus, and lastly, to bring about a healthy color of the gum tissues. To this end I continued the solution of salicylic acid, as recommended by Dr. Townsend, as being the best remedy, in my opinion, to invite granulations from the farthest point of the sinus, and preventing a closure of the orifice, and made a topical application with aconite and iodine; directing the lady to continue Dr. T.'s constitutional treatment.

When the lady left me in six or eight weeks, the incisor and bicuspid were as firm as the other teeth, and the cuspid was much firmer than when I first saw her. I had the pleasure of seeing the case some months subsequently, and the granulations were making rapid progress toward a completion of the ultimate desire. The cuspid was firm, but not as firm as the other teeth, still very encouragingly so, much to my gratification, and thanks to Dr. T., and Mrs. R., who so kindly seconded my best feeble efforts towards the conclusion which I am now glad has been reached.—*Dental Advertiser.*

ARTICLE VII.

Bromide of Ethyl.

This new anæsthetic has been recently advanced on the testimony of Drs. Turnbull and Levis, of Philadelphia, who have submitted it to quite an extensive trial, as a substitute for chloroform and ether. It is a transparent, colorless fluid, of a sweetish taste, rather agreeable ethereal odor, and sparingly soluble in water. The agent is, however, in fact, not a new one, having been discovered as far back as 1827, from which time until 1849 it attracted little or no attention. In the latter year Dr. Thomas Nunnelly, of Leeds, England, made some experiments with it on animals. In 1865 he read a paper on the subject before the British Medical Association, but so great was the popularity of chloroform at that time that but little attention was paid to the ethyl bromide. The agent is now, therefore, new only in the sense of the term as applied to many other articles of recent introduction, that is, its properties are but being developed and the profession being familiarized with them.

The claims made for the bromide of ethyl are based on its non-irritant action either on the respiratory or other membrane, it being capable of injection subcutaneously, of application to the conjunctiva or to the means of the ear without exciting inflammation or irritation. It is said, also, to be more rapid of action, more rapidly eliminated, more pleasant of administration than even chloroform, and less apt to produce retching or vomiting. The chief claim made for it, however, is its safety as compared with all other anæsthetics. Safety is the great desideratum of anæsthesia, and it is not strange that the profession should hail an agent whose claims to supply it are so strongly urged. Bromide of ethyl has been employed in Philadelphia in over two hundred cases, not only without untoward result but with happy effects never associated with the administration of any other anæsthetic. Such a record is certainly sufficient to entitle it to sufficient confidence to ensure a more extended trial by the general profession.

But in the midst of the general rejoicing at the securing of the great boon comes a report from New York, which in itself admonishes us to take heed where we stand lest we fall. Chloroform was administered to thousands of cases before a death occurred, and for a long time ether was considered absolutely safe. Bichloride of methylene has been given by Spencer Wells a thousand times without an accident and yet a voice comes up from the profession saying that it is not less dangerous than chloroform. Dr. J. Marion Sims, in the *Medical Record* of April 3rd, reports a case in which he lays the death at the door of bromide of ethyl. The patient was a young woman on whom Battey's operation was performed for the relief of epileptic attacks supposed to be due to a diseased ovary. The operation lasted an hour and a half; the patient recovered speedily from the anæsthesia, but was left with a violent headache and retching, and the vomiting which developed during the administration of the anæsthetic continued unabated. A profuse diarrhœa of a cholerine nature, also set in, the discharges being of a dirty brownish watery nature with tenesmus and mucus, and smelling heavily of the vapor of ethyl. The symptoms continuing delirium supervened and the patient died about twenty-one hours after the operation. A *post mortem* examination was made and the tissues were found to be strongly impregnated with ethyl; the urine also contained it. The kidneys which to the naked eye looked normal were found under the microscope to contain an increase of interstitial tissue together with signs of catarrhal nephritis. These are the essential facts of the case. Whether the death was caused by the ethyl or by the diarrhœa or cholerine, and if the latter whether it was set up by the ethyl or by three drachms of Rochelle salts given some five hours before the operation, are points which remain unsettled. The case disproves the claim made for ethyl that it is entirely gotten rid of by the lungs, and shows that, as in the case of ether, the kidneys play an important part in the process of elimination. This latter point conceded, it follows that there is danger in the administration of bromide of ethyl in organic disease of the kidney. The danger is similar to that attending the use of ether. In the deaths reported as following the use of ether the kidneys have been found to be affected and the suspicion created that uræmia was an important factor in the causation of death.

Dr. Sims closes the report of his case as follows:

"Dr. Levis has had a larger experience with this anæsthetic than any other surgeon, but his longest operation was but forty minutes, whereas my unfortunate case lasted an hour and a half. It may be that we did not administer the ethyl as skillfully as it should have been done. But I do not think we could have given less and maintained the anæsthetic sufficient for its purpose.

If the operation had been comparatively short—if it had lasted only twenty or thirty minutes—if it had terminated before my patient's system, solids as well as fluids, became thoroughly saturated with it, she would in all probability have recovered; but, as it was, it seemed to kill by supersaturation which could not be eliminated, even with the aid of the whole mucous tract of the alimentary canal to aid the lungs. If mine had been a short operation, I might to-day have been lauding the new anæsthetic as a veritable boon to surgery. But, as it was otherwise, I must raise a warning voice, especially in prolonged operations.

It would be an interesting scientific inquiry to determine if ethyl-poisoning by inhalation produced cholerine with a deeply congested condition of the mucous membrane of the lower portion of the alimentary canal, and also to determine what other pathological changes it might induce.

This could easily be done by experiment on the lower animals, and it is to be hoped that some of our physiological *savans* will soon tell us by such experiments what we have to hope and fear from the long continuance of the bromide of ethyl as an anæsthetic.

The inference that I draw from the facts in the history of this case is that the anæsthetic was the cause of death, while the manner of death may have been by uræmic poisoning. The lesson from this is, never to give bromide of ethyl in prolonged operations, and never to give it where there is organic disease of the kidneys. What, then, shall we give?"

While it would perhaps be scarcely just to hold hydrobromic ether responsible for the death the case is sufficient to dispel the hope that the desideratum of anæsthetic, absolute safety, has been supplied, and to convince the profession that care is no less necessary than in the use of other anæsthetics. The warning comes in season and may be the means of preventing the abuse of the drug to which its pleasant nature and the ease of its administration is prone to tempt.—*Therapeutic Gazette.*

ARTICLE VIII.

Aconitia in Neuralgia.

The affections known under the general name of neuralgia, which are so painful, and in the majority of cases so difficult to treat, have for a long time been the subject of constant investigation at the hands of a number of experimenters. Clinical experience has recently demonstrated the powerful anti-neuralgic action of crystallized aconitia, and the excellent results which have been obtained by the use of this remedy in the hands of Dr. Oulmont have fully confirmed the opinions in regard to it which have been already advanced. Aconitia, says Dr. Oulmont, is perfectly successful in such forms of facial neuralgia as are not correlated with other lesions which are not intermittent, and which have not a well marked recurrence; in other words, in those forms to which M. Gubler has applied the term congestive, and which are most frequently caused by exposure to cold. In such cases aconitia produces a rapid cure within two or three days. Dr. Oulmont has even seen a case of facial neuralgia of seven day's standing, in which there was no well marked periodicity, and which had resisted sulphate of quinia, yield instantaneously and permanently to a quarter of a milligramme of nitrate of aconitia (one milligramme is equal to one-sixtieth of a grain.) The results are more marked and rapid in cases of recent neuralgia than in those of long standing. Examples are quoted, however, in which the affection had lasted for periods of one month, two months, and even five years, but which had yet been cured, the first on the seventh day, the second on the third, and the last in three weeks. Aconitia has also a distinct effect in secondary neuralgia, as, for example, in dental caries, otitis, paraplegia, etc.

Acute rheumatic arthritis may be successfully treated with aconitia. In four individuals to whom this remedy was administered in doses, at first of half a milligramme per diem, increased gradually to one and a half milligrammes, a cure was affected, once in eight days, and once in ten days. The temperature fell from 39° to 36° (102 to 97° F.) and the pulse in proportion. In the other cases the cure was equally obtained, but only on the fifteenth and eighteenth days respectively, whilst the dose was raised to two and a half milligrammes. The antipyretic action, however, was equally well marked, whilst the temperature fell on the eighth and ninth days about two degrees. The results obtained by M. Gubler are also noteworthy. The results of four cases are published; in these the patients were treated with hypodermic injections of half a milligramme once or twice a day, whilst half a milligramme of aconitia, which was gradually increased till this quantity was taken two to four times a day, was administered internally. In these cases a cure was effected upon the sixth, ninth, twelfth, and thirteenth days; in one case there was a slight stiffness of the joints. The influence of the remedy upon the painful symptoms was very rapid upon the second to the fourth days, whilst upon the fever it was slower, though not less marked. The effects are very remarkable according to M. Gubler in cases of neuralgia of the fifth.

Dr. Oulmont concludes his work with the statement that aconitia is a remedy of importance, since it acts in a certain definite manner upon the human organism, but from its activity it must only be employed in very small doses and at long intervals. Neuralgia is often accompanied by intermittent symptoms and well marked periods. In such complications quinia must be employed in addition to aconitia. On account of the energetic action of the remedy the susceptibility of the patient should be tested by administering, in the first place, three pills daily, each containing a fifth of a milligramme of crystallized aconitia in addition to five centigrammes of pure quinia; one in the morning, one at midday, and one in the evening. If no alleviation of the pain is experienced on the first day, the dose may be cautiously augmented by a pill per diem, until a maximum dose of six in the course of twenty-four hours is attained, and in the majority of cases it will not be necessary to overstep this limit. If slight diarrhœa occurs, the dose must be reduced. Physiological experiments and clinical observations carried on in the Paris hospitals have shown us that these pills have a sedative influence upon the circulatory apparatus through the vaso-motor nerves, and it is concluded therefore that they are indicated in neuralgia of the fifth, in congestive neuralgia, in painful and inflammatory rheumatic affections, etc.—*Am. Jour. of Med. Sciences, from Le Progres Medical.*

ARTICLE IX.

The Natural Dentine for Capping Exposed Teeth Pulps.

BY DR. THOMAS C. STELLWAGEN.

Some time since I called the attention of the dental and medical professions to the use of the actual cautery, by means of a coal of fire made by igniting hickory pivot wood, such as is prepared for dentists by being seasoned and condensed by passing through steel draw-plates.

It is recommended by its simplicity, inexpensiveness and efficiency. Use has proven it of value in treating superficial abnormal growths, hæmorrhage, sensitive dentine, etc.

To-day I ask you to consider the natural dentine for capping exposed teeth pulps.

It was during the examination of the last class but one that graduated from the Philadelphia Dental College that it occurred to me to seek for some more natural and simple means for the immediate covering of exposed dental pulp tissue.

The number of articles, already used for the purpose is so great, that the mere attempt to recall them requires considerable mental effort. I am about to add one more with the hope of shortening the list by having it universally adopted, to the exclusion of the others.

Medical science has demonstrated that where an ulceration of the skin has become chronic, the transplantation of small particles of epidermis from a healthy surface of the body, has the effect of assisting in the healing of the ulceration; the transplanted tissue cells acting as nucleuses about which the new first develop, as coral reefs in the ocean eventually become islands. A step further and we remember that small portions of bone or periosteum are often used in the same manner for producing centers of ossification, where bony tissue has been lost. They seem to resemble the points of ossification in the cartilaginous skeleton of the infant.

Attempts to assimilate the capping material to the dental substance have been made which are so ingenious and useful that it would seem to be a pity that they had not realized the hopes of their projectors. They serve, however, to show that all who study the operation wish to attain the greatest similarity of tissue.

Why not then use the tooth substance?

After removing the diseased structure, if the pulp is exposed allow the wounded surface to glaze over, and then, with a keen, sharp excavator, shave off from the walls of the cavity enough healthy dentine to cover over the point to be capped. After this is accomplished place a small metallic cap—platina I generally prefer—to which enough gutta-percha has been attached, by warming, to hold it in position, and proceed to fill, taking care not to displace this bridge, which is designed to protect from pressure and as an additional non-conductor of heat and electrical currents.

On no account wash or remove the powdered healthy dentine from the surface of the glazed pulp. Keep all other substances from coming in contact with this delicate tissue, whether they be the so-called medicaments such as creosote, carbolic acid, chloride of zinc or even simple alcohol or water; they are foreign bodies and are apt to excite inflammation.

The operation as described has been most successful with me, and for about eighteen months I believe I have capped every exposed pulp this way. My successes embolden me to beg of you to accept my recommendation of it as worthy of trial.—*Trans. American Dental Association.*

ARTICLE X.

The Effect of Smoking on the Teeth.

At a late meeting of the Odontological Society of Great Britain, Mr. Hepburn read a paper on this subject, and the results of his investigations on the subject are contrary to what is, we believe, the popular notion. He considers that the direct action of nicotine upon the teeth is decidedly beneficial. The alkalinity of the smoke must necessarily neutralize any acid secretion which may be present in the oral cavity, and the antiseptic property of the nicotine tends to arrest putrefactive changes in carious cavities. In addition he is inclined to believe that the dark deposit on the teeth of some habitual smokers is largely composed of the carbon with which tobacco-smoke is impregnated. It is this carbon which is deposited upon the back part of the throat and lining membrane of the bronchial tubes; and with whatever disastrous effect it may act in these situations, he thinks we are justified, from what we know of its antiseptic properties, in concluding that its action upon the teeth must be beneficial. Moreover this deposit takes place exactly in those positions where caries is most likely to arise, and on those surfaces of the teeth which escape the ordinary cleansing action of the brush. It is found interstitially in all minute depressions, and filling the fissures on the coronal surfaces. It may be removed with scaling instruments from the surface of the enamel, but where it is deposited on dentine this structure becomes impregnated and stained. Indeed it is only where the enamel is faulty and there is access to the dentine that any true discoloration of the tooth takes place; but it is remarkable, he says, how the stain will penetrate through even minute cracks, provided the necessary attention to cleanliness be not exercised. The staining power of tobacco-oil may be seen when a deposit has taken place on the porous surface of tartar collected on the posterior surface of the inferior incisors. In this situation a shiny ebony appearance is occasionally produced. That tobacco is capable of allaying, to some extent, the pain of toothache, is, he thinks, true; its effect being due not only to its narcotizing power, but also to its direct action upon the exposed nerve; and he is inclined to attribute the fact of the comparatively rare occurrence of toothache among sailors in a great measure to their habit of chewing. He has been struck, in the case of one or two confirmed smokers who have come under his notice, by the apparent tendency which exists toward the gradual production of complete necrosis of carious teeth, and the various stages of death of the pulp and death of the periosteum taking place without pain or discomfort to the patient. This condition may of course be brought about by a variety of influences, but in these special cases he is inclined to think that the presence of nicotine in the mouth has acted powerfully. The experience of other speakers in the subsequent discussion appeared to corroborate that of Mr. Hepburn, except that Mr. Oakley Coles thought the frequent changes of temperature probably injurious and tending to produce cracking of the enamel, and Mr. Arthur Underwood thought that smoking to the extent of injury to digestion tended to cause recession of the gums and otherwise to injure the nutrition of the teeth. —*British Medical Journal.*

ARTICLE XI.

The Treatment of Neuralgia.

Aconite is an old remedy in Neuralgia which has, however, not altogether realized the expectations which were formed of its value. The power which it often lacks, has been lately claimed for its alkaloid by Professor Gubler, who announced that aconitia is almost infallible in trigeminal neuralgia. This substance was long banished from the materia medica for internal use, but it has been employed occasionally since the discovery of a crystallized form by Gréhaul and Duquesnel in 1871. Its value in neuralgia has lately been investigated by the New York committee on Neurotics, of which Dr. E. C. Sequin is the chairman. The dose of all forms of aconitia is about the same. The initial dose being about half a milligramme (or 1 130 grain) twice or thrice a day. There are differences in susceptibility and some persons cannot bear a larger dose than 1-200 grain; while one case was met in which 1-84 grain every three hours was tolerated. From a trial of the treatment in a series of cases, the committee conclude that, on the average, distinct physiological and therapeutical effects may be obtained by giving 1-100 grain three times a day. Of six cases of severe trigeminal neuralgia, one, probably a reflex neuralgia from a decayed tooth, was not at all benefited. Three cases of epileptiform neuralgia were slightly, or only temporarily relieved. Two cases were cured. One of them had existed for seven years, with an interruption of seven months, procured by resection of the affected nerve. The results thus afford a partial support to M. Gubler's assertion.

The value of ammoniacal sulphate of copper in the treatment of the same affection has been asserted by Mr. Fereol in a recent communication to the Academie de Medicine He states that in cases in which every treatment has failed even the administration of gelseminum and of aconitia, a cure or remarkable relief may be obtained to the most severe symptoms by this drug.

Among the examples he gave of its use was the following: Trifacial of two months' duration, with absolute (?) insomnia, was unrelieved by the extraction of teeth, quinine, bromide, aconitia, or tincture gelseminum, hypodermic injections of morphia or arsenic. From the first day of the administration of the ammonia sulphate of copper, there was a notable remission in the symptoms and cessation of the insomnia. In one case, the dose was pushed to eight grains, without any other accident than nausea. It has the drawback of occasioning a persistent metallic taste in the mouth. One case of intolerance was met with; in that a grain and one-half of sulphate of copper occasioned violent vomiting.—*London Lancet.*

EDITORIAL, ETC.

Suppression of Fraudulent Diplomas.—For a number of years past Philadelphia has been the seat of several bogus Colleges which have been flooding this and foreign countries with fraudulent medical and dental diplomas. The Legislature of Pennsylvania tried in 1872 to suppress the institutions, but failed, and they have been run ever since on legally issued charters. The authorities declared themselves powerless to stop it. Six months ago the city editor of the *Record*, John Morris, called the attention of Attorney-General Palmer to these concerns and the grave necessity for their suppression. But the State had no evidence against them and the Attorney-General had no money with which to proceed. Then the *Record* offered to advance the funds to the Commonwealth upon promise of reimbursement by the State Legislature, and the work commenced. The other day it culminated in proceedings which will suppress five bogus medical colleges, and in the arrest of John Buchanan, dean of the American University, of Philadelphia, and the Eclectic Medical College of Pennsylvania. He was also President of the National Eclectic Medical Association, which issued diplomas, and, under the alias of James Murray, D. D., he acted as dean of a concern issuing its diplomas as the Livingston University of America. Two others of the faculty, Charles S. Polk and John J. Seggins, were arrested, while six others of the faculty are still at large, apparently out of the reach of the police.

The City Editor of the *Record* has prepared evidence which it is alleged will show the sales of forty-two diplomas to various persons. He gives the names of eleven others to whom the diplomas were offered, and the names of eleven agents who were acting for Buchanan. The *Record* man himself set the trap which secured Buchanan. For $75 he obtained three medical diplomas, one in English, from the Eclectic Medical College of Pennsylvania, a regularly chartered institution; one from the American University of Philadelphia, in English, and another from the National Eclectic Medical Association.

One feature of the proceeding is that while the last-named concern was organized in 1879, its diploma to the newspaper man is dated 1878. All purported to show that the newspaper man, under the name of Dr. John Fanning, of Tippecanoe City, Ohio, studied medicine for three years, had attended two full courses of lectures, and had passed a satisfactory examination in each of the seven branches of medicine. Not satisfied with this evidence, he sent letters under the name of Dr. George A. Dawson, apparently belonging to Chester Court-House, S. C., asking for degrees. For $150 he obtained five degrees, two of doctor of medicine, one doctor of divinity, one doctor of law, and one doctor of civil law.

The final letter in this transaction passed through the mail, Dr. Buchanan receipting for it. He also deposited the diplomas in the mail to be delivered to the spurious doctor in South Carolina. Special Postal Agent Barrett, Chief of Police Given, a Deputy United States Marshal, and the newspaper man walked into Buchanan's place this afternoon, arrested him, and then captured about half a ton of bogus diplomas, with a mass of correspondence, showing the traffic in diplomas and the sale of about 3,000 sheepskins.

These bogus College faculties have been selling diplomas "for a consideration" to every part of the world, but especially to Germany. John Buchanan, the alleged chief offender, was committed by the United States Commissioner in default of $10,000 bail on a charge of using the mails in connection with the business. The final exposure and arrest were due, as before stated, to the enterprise and public spirit of Mr. John Morris, City Editor of the Philadelphia *Record*, who accomplished what the legal authorities have repeatedly failed to achieve. Recently the matter has been brought conspicuously before the public by some correspondence of President A. D. White, of Cornell University, at present United States minister to Germany and which was published in a recent number of this Journal. Mr. White resented some allusions in a popular farce to quacks created by American ready-made diplomas, but at the same time admitted and deprecated this traffic in spurious degrees. The matter was, however, exposed and ventilated several years ago by the New York *Nation.* On that occasion one of the persons accused in the present case proved that he represented a regularly chartered college, with authority to grant diplomas, and threatened a suit for libel. In the course of the controversy which ensued it came out that Germany's skirts were not clean in regard to these same practices about which its people bring such loud accusations against this Country. It was proved that the great University of Leipsic had been in the habit of vending its diplomas to liberal bidders, and three cases were cited of such diplomas granted within the year. The practice, however, has been entirely broken up in Germany, and it is to be hoped that the present exposures and prosecutions will end in breaking it up in this country also. The evils caused by this system are very numerous and very great. The fraudulent character of the diploma, heinous as that is in a moral point of view, is the least of these evils. The system is injurious in the highest degree to regular medical and dental colleges, which conscientiously aim to give thorough and scientific instruction. It is discouraging to all regular practitioners, who have prepared themselves for the business of their life by long and laborious studies. When a man has studied medicine or dentistry for years, it is simply disheartening to him to find a pretender, who may scarcely have read anything, put on an equality with him by a spurious diploma.

We are glad to learn that there is every reason to believe that this sale of diplomas has been suppressed and the offenders brought to justice.

Is It Found?—"Näbolï" is the rather fanciful name given a new local anæsthetic by Dr. H. E. Dennett, of Boston, by which, it is claimed, the pain of sensitive dentine is so modified or destroyed as to render painless what was the terror of dentistry, to patients at least. The Boston *Commonwealth* contains the advertisement of the "Dennett Näbolï Company," with certificates from nearly thirty dentists of New England, in praise of this new compound.

From the appended extract from the proceedings of the Massachusetts Dental Society, published in the Boston *Daily Evening Traveller*, it would seem that that Society is rather severe on "Näbolï;" although the "Company" publish in a subsequent issue of the same paper a letter from the president of the meetings of the Society at which these same strictures were passed in which he says:

"I *know* this remedy, if properly applied, is effectual, and I know that it cannot by any possibility do injury to the tooth or patient; and I feel sure if dentists everywhere adopt its use, their patients will not only be grateful to them but to you also for having placed it within their reach.

As to the propriety of your patenting this discovery, there will be a difference of opinion among our professional brethren. But as I knew nothing of the *intention* or the *fact* till it was accomplished, I have only to submit and comply with such terms as your 'Näbolï' Company demand, as I cannot practice dentistry with the least degree of satisfaction without it."

Here is what the Society said about it.

"At the late session of the Massachusetts Dental Society, the subject of "Näbolï," the new so-called anæsthetic, was taken up. The conduct of certain members of the Society in adopting its use and publishing advertisements or issuing cards or circulars intimating or explicitly stating that they had superior facilities for dental operations by reason of having purchased the right to use the article, was deemed unprofessional, and articles of impeachment were presented against three of the dentists, one of Boston, another of Salem and another of New Bedford. The ground of impeachment alleged was two-fold; 1st, That to advertise in any "quackish" manner by intimating the possession of superior facilities, is contrary to the by-laws of the society; and, secondly, that the Näbolï is a preparation of no scientific merit, but is compounded of articles which have long been in use either separately or in combination, and that its sale and use are urged by the manufacturers of it as a speculation on their part. It was also alleged that the preparation often fails to produce anæsthetic effects, and that there is no good sanction for its use. These points and various side issues were debated in a very lively manner, and the following resolutions were passed:

Resolved, That it is the duty of every dentist to understand the nature of all the materials and medicines which they use or are to use, before placing them in the mouths of their patients, and that any medicine, the formula of which is kept secret, is not worthy of their confidence or the confidence of the public.

Resolved, That the analysis of "Näboli," made by able and competent chemists, show that it is no new discovery, but is composed of agents at the command of each dentist, and that no license is needed to use such old and well-known medicines.

Resolved, That the Massachusetts Dental Society, after a long discussion, are of the opinion that the "Dennett' Dental Näbolï Company" is a stock jobbing concern, designed to impose upon the public and blackmail the profession.

Under the rules no action can be taken on the impeachment articles till next December."

How far these opinions would be modified by "Näbolï" being made as free as the "rubber dam," we have no means of judging; but trust that at last a real pain obtunder for dentine is discovered.

H.

Is Expansion a Cause of Leakage in Fillings?—In conversation with an old and thoughtful dentist, the suggestion was made by him to the writer that one of the causes of the loss of the integrity of fillings was due to expansion; and he (a soft foil advocate,) was inclined to believe that one of the troubles with cohesive foil was that its density alone, making it more susceptible to thermal changes, caused the "starting" of such fillings, and their consequent leakage. The idea is of course not a new one, but it suggested to the writer the thought that some experiments might be made serviceable in determining this point; and associated with the cohesive and non-cohesive gold foils, experiments were made also upon tin foil and one or two varieties of amalgams.

A piece of ivory was selected of some size, and five holes drilled in it on the smooth side. These were made with great care, pains being taken that the sides should be parallel and as smooth as possible, so as to afford no obstacle to the starting of the fillings subsequently inserted.

The bottoms were concave, being formed by a plug-finishing bur of egg shape.

The first cavity was filled with the "Boston (Frost) Dental Amalgam;" the second with the "Standard Alloy;" the third with tin foil; the fourth with Abbey's soft or non-cohesive gold; and the fifth with annealed, highly cohesive gold. The tin and Abbey's foil were put in with hand pressure, and the cohesive foil malleted in with a steel mallet, the ivory being tightly screwed in a vise. The amalgams were worked rather dry, although somewhat plastic. When these last were seemingly solidly set, some hours having elapsed, the respective fillings were dressed off perfectly smooth, no burnishing being done, and finished with a flat scotch stone.

The piece thus finished was then laid in the snow on a cold day in winter, and when thoroughly chilled was plunged into boiling water. This alternate freezing and thawing was repeated three times. An inspection of the fillings was then made.

The Frost Amalgam had started quite visibly and the finger nail caught readily against its edges. The Standard Alloy was quite decidedly projected from its cavity, rather more so than the other amalgam. The tin foil was so slightly raised as to be hardly visible to the eye without a magnifier, and the condition of the non-cohesive and cohesive gold fillings were much the same as the tin. There was little perceptible difference between the two varieties of gold foil; if anything the non-cohesive filling was projected from its cavity slightly more than the other.

From this experiment it might be concluded that little difference exists between the relative expansion and consequent "starting" of fillings made respectively of tin, non-cohesive and cohesive foil, between the thermal points of 32° F., and 212° F. But as single experiments are worth little, these facts are made public that some such lines of investigation may be taken up and developed into certainty. H.

At Last.—The papers of June 10th give an account of a "raid" made on a number of so-called medical colleges in Philadelphia which for years past have scattered "bogus" medical diplomas from that city over this and foreign lands. We believe that the fraudulent dental diplomas issued in the same city are from this firm; if this is true, this raid will prove as great a blessing to the dental as to the medical profession. According to the reports they have been selling diplomas "for a consideration" to every part of the world, but especially to Germany. Dr. John

Buchanan, the alleged chief offender. has been committed by the United States commissioner in default of $10,000 bail on a charge of using the mails in connection with the business. The final exposure and arrest were due to the enterprise and public spirit of Mr. John Morris, city editor of the Philadelphia *Record*, who accomplished what the legal authorities have repeatedly failed to achieve. Recently the matter has been brought conspicuously before the public by some correspondence of President Andrew D. White, of Cornell University, at present United States minister to Germany. Mr. White resented some allusions in a popular farce to quacks created by American ready-made diplomas, but at the same time admitted and deprecated this traffic in spurious degrees. The matter was, however, exposed and ventilated several years ago by the New York *Nation*. On that occasion one of the persons accused in the present case proved that he represented a regularly chartered college, with authority to grant diplomas, and threatened a suit for libel. In the course of the controversy which ensued it came out that Germany's skirts were not clean in regard to these same practices about which its people bring such loud accusations against this country. It was proved that the great University of Leipsic had been in the habit of vending its diplomas to liberal bidders, and three cases were cited of such diplomas granted within the year. The practice, however, has been entirely broken up in Germany, and it is to be hoped that the present exposures and prosecutions will end in breaking it up here also. H.

Important Notice.—A Mass Convention of the Dentists of the United States will be held in New York City, Wednesday, Aug. 11, 1880, at 11 o'clock A. M., for the purpose of organizing a National Dental Association, to be composed of every State Society in the Country. Information concerning place of meeting can be obtained at White's Dental Depot, 767 Broadway; Johnston Bros' Dental Depot, 1260 Broadway; and the Sturdevant House, Broadway.

MONTHLY SUMMARY.

Cure of a Traumatic Salivary Fistula.—In the *Medical Press and Circular*, February 18, 1880, we find a report of the following case by Mr. Henry Morris:—

A shoemaker came under my care in the Middlesex Hospital on June 24, 1879, for bleeding from several incised wounds, one of which was about two inches long, and vertical in direction, on the right cheek. On June 28th saliva was seen trickling from the lower end of this wound, which was all but healed. The patient now stated that since the injury the right side of the mouth felt very hot and dry, and that he had constantly to moisten it by carrying the fluid from the left side over to the right of his mouth. A fine cat-gut bougie was introduced at the oval aperture of the duct, and passed onward toward the parotid gland until it emerged on the cheek through the fistula. The newly-healed wound was laid open, and the proximal end of the injured salivary duct searched for, and found by squeezing the parotid gland until a little saliva was forced out of the duct. Into this the point of the bougie was inserted and pushed onward for about half-an-inch. The edges of the wound were brought together with three hare-lip pins and twisted sutures, and the bougie cut short, so that a short end, not long enough to be caught between the molar-teeth, was left protruding into the mouth from the slit-like orifice of the duct. The patient at once appreciated a marked difference in the feeling of the right side of the mouth, which was now in all respects like the other side, and he could distinctly feel saliva trickling into it. On July 4th the bougie came away accidentally. The wound on the cheek had been all but healed for four days, but a little discharge still escaped at its lower end. On July 9th a little saliva was escaping still: cotton wool and collodion were therefore continued over the wound until the 15th of July. By this date the wound was securely healed, and all the saliva flowed freely into the mouth. The man was retained at the hospital for a few days longer, and was then discharged well. The facility with which a bougie can be passed along the parotid duct from the mouth encouraged the author to think that the same treatment would prove successful in most cases of parotid salivary fistula, meaning by salivary fistula a fistula of the parotid duct as distinct from a fistulous communication with the parotid gland itself, such as occasionally follows abscess below or behind the ear; and also as distinct from an opening into the cavity of the mouth, such as sometimes occurs after necrosis of the jaw, and in cancer. If the orifice of the duct, which is its smallest part, becomes obstructed after long disease, the mucous membrane of the cheek may be punctured, and then a bougie might be passed into the dilated part of the duct, which is just where it pierces the buccinator muscle, and urged along it beyond the fistulous opening. In operations for the removal of tumors of the face, when an incision must be made so as to divide the duct, it would be well to pass a parotid bougie while the patient is still under chloroform, so that the potency of the duct and the flow of saliva into the mouth might be secured during and after the healing of the wound —*Medical & Surgical Reporter.*

The Use and Abuse of Tobacco.—From the earliest ages narcotics have been used in various forms by the human race, and to this practice amongst the heathen, Isaiah probably alludes when he upbraids the Jews for "remaining in the groves and lodging in the monuments;" for at that time it is well known that men went into the heathen temples to place themselves under the influence of some narcotic, presumably opium; and so with other races. In the South of Asia the betel leaf, with areca nut and a little "chunnum" (lime produced from burning shells,) is said to act on the nervous system by soothing, and at the same time promoting digestion, the latter action is open to doubt. The cocoa leaf has likewise been much vaunted, but in this country has not proved so valuable as it is said to be in Peru, where the miners use it regularly, chewing it with lime. Tobacco is one, and one of the least harmful, of those agents by which soldiers and others who are compelled to undergo strenuous exertions at times, with a sadly insufficient supply of food, are enabled to hold out and do their work effectively. What opium is to the Tartar courier, or cocoa leaf to the Peruvian miner, tobacco is to the British soldier and sailor, in supporting him under severe and continuous efforts, when rest and sufficient food are alike beyond his reach. But the pernicious habit of smoking at any and at every time, as is practiced in the present day by persons in full health, is a useless, dirty, and an expensive one, and is too often injurious, in an indirect manner, by its acting as an inducement to drink. It is true that the more the wants of man are multiplied, the more industrious he becomes; but the use of tobacco is at once a dirty and an offensive luxury, and, with the exception of ardent spirits, there is hardly any article in which the money of the poor would not be better expended. There can, I think, be no doubt that the habit of smoking is spread more from the force of example than from any beneficial results produced by it. As regards the physiological action of tobacco upon the bulk of mankind, and apart from its moral influences, it may be received as characteristics of this substance amongst narcotics, 1st.—That its greater and first effects are to assuage, and allay, and soothe the system in general with a temporary annihilation of thought. 2nd.—That its lesser and second or after effects are to excite and invigorate, and at the same time to give steadiness and fixity to the powers of thought. The most familiar of the physiological effects of tobacco are those experienced by young smokers, who rarely fail to poison themselves to a greater or less extent, nausea, giddiness, cold sweating, and vomiting being the symptoms in their first trials. According to a celebrated writer, speaking on the effects of smoking, he states that he has repeatedly asked the Turks what they had been thinking about whilst smoking? The answer was: "Of nothing." Not a single idea could be recalled to their minds. This may be a peculiarity of the Turkish or Moslem character, but I have heard fellow-students remark that they could do no real study while smoking. However, it is a known fact that some German writers invariably smoke while writing. If it is so conducive to thought, why should it be so exclusively enjoyed by the male sex? I will conclude with an extract from the "Counter-blast to Tobacco"—"Have you not reason, then, to be ashamed and to forbear this filthy novelty, so basely grounded, so foolishly received, and so grossly mistaken in the right use thereof? A custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in black stinking fume thereof nearest resembling the horrible Stygian smoke of the pit which is bottomless."—*W. R. Glover in Druggists' Circular.*

The Value of Revaccination.—The *Medical Times & Gazette* informs us that while smallpox is prevailing extensively amid the civil population of Paris, so as to give rise to seventy or eighty deaths weekly, it is almost absent in the large military force which constitutes the garrison. This is entirely due to the rigidity with which revaccination is enforced. It is stated that there are not more than twenty cases in the military hospitals, most of them being only examples of slight varioloid, and no deaths having occurred. Every year for some time past revaccination is enforced on the arrival of the contingents; and a great number of men have been revaccinated this year in whom revaccination did not succeed last year. Every revaccination is performed from children's arms, whose parents are paid fifteen francs per sitting. What few cases of smallpox do now occur take place among the officers, or in obstinate or timid men who manage to evade revaccination.—*Medical and Surgical Reporter.*

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OF
DENTAL SCIENCE.

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ARTICLE I.

Transactions of Odontological Society of Great Britain.

Dr. Walker read the following communication: With your permission, Mr. President, I will allude to the fact that in daily practice we are frequently called upon to give an opinion as to the probable duration of a swelling in the maxillary region. The following case may prove to us how hazardous a hasty opinion may prove to be:

A man, aged 35, consulted me, but apparently with great repugnance and indifference, stating even before he had made a foot's entrance into my consulting room, that if his medical man had not refused attendance until he had consulted a surgeon of our specialty and supported this by a threat of discontinuing his treatment altogether, he would not have come to town, as his teeth had been examined many times before and found quite sound.

On enquiry, I ascertained from the patient that twelve months previously he had experienced great pain in the left side of his face and head. After a few days this was followed by throbbing and dull heavy pain in the whole of the superior maxillary region. In a few weeks from the date of the first attack, pain in the left ear and in the region of the temporal bone supervened and continued for weeks, with swelling over the mastoid cells under the sterno-mastoid muscle; resulting in due time in a large abscess, followed by several smaller ones in the same region; debility, and weakness of the general constitution; consistent with the formation of pus. This was succeeded by occasional indistinct visions in the left eye, which increased until he lost the sight.

He had taken several months' rest with total cessation of business and frequent changes to the seaside, but with no beneficial result.

On examination the left eyeball was of different color to the right; there was no apparent swelling in the region of superior or inferior maxilla. There were citricacies over the mastoid cells, but no accumulation of pus.

The hard palate appeared quite healthy; there was slight redness around the margins of the first and second molors; only very slight fullness between the facial muscles and the maxillary bone; no tenderness on pressure. On careful inspection and examination of the teeth, with the assistance of the mouth mirror, all the teeth appeared sound. No discoloration was apparent, even with a strong reflected north light. On digital examination (with the head firmly grasped) all the teeth were quite firm, except the second left upper molar. In this tooth I could feel distinct motion, but with no visible signs of elongation. On introducing a hard substance between the upper and lower teeeth and applying severe pressure by the heavy closure of the jaws, the second molar jaw gave no sign of tenderness. By isolating the second molar with prepared cotton wool placed around the other teeth, and the injection of cold water with a large syringe, a paroxysm of severe pain was the immediate consequence. On extraction of this tooth, one ounce of pus passed into the mouth through the palatine socket. In this case, the palatine fang of the second molar had perforated the floor of the antrum; obscure caries on the posterior proximal surface of the tooth had generated pus, which ac cumulated in the antrum, then passed back through the fallopii to the ear, and under the sterno-mostoid muscle, pointing to the surface. Or, by absorbing a portion of the hard palate, the pus might have passed through the posterior palatine canal into the spheno-maxillary fosse, then through the spheno maxillary fissure. The patient made a good recovery with perfect restoration of sight.

The President remarked on the interest of the case and the difficulty of the diagnosis, and complimented Dr. Walker on the clearness with which he demonstrated the probable course of the pus on his prepared specimens.

Mr. Sewell said there was one statement in the very interesting communication which Dr. Walker had just read which he was not disposed to accept without farther evidence, viz., that the pus did actually travel to the petrous portion of the temporal bone by way of the canals which Dr. Walker had enumerated. He thought it much more probable that the pus had passed along the bones externally, burrowing in the usual way under the muscles and fascia; especially since there had been no ifntererence with the function of hearing which would probably have happened, had the bone been the seat of an abscess. So, also, he thought that the effects of the eye might be more easily explained by supposing that the pus in the antrum had exerted upward pressure on the floor of the orbit. Had this been the case, considerable disorganization of the contents of that cavity must have resulted, and there would not have been such a rapid recovery after the evacuation of the matter; whilst, on the other hand, very similar symptoms might be observed as the result of pressure in cases of tumor of the antrum. But these criticisms did not in the least diminish the interest in the case, nor could they lessen the credit due to Dr. Walker for having correctly diagnosed such an exceedingly obscure case.

Mr. Gaddes remarked that the influence of the nervous system in exciting purulent secretions on parts remote from one another must not be lost sight of. It might be that in this case the presence of pus in the neighborhood of the ear had been due to the transmission of a reflex nervous impulse, and not to the actual travelling of matter from the superior maxilla to the temporal bone.

Dr. Walker said that a detailed reply to Mr. Sewell's criticisms would take up more time than could be spared that evening, but he might state that this was not the first case of the kind which he had met with. On several occasions patients had been sent to him by ophthalmic surgeons, who had detected the presence of pus in the orbit and had found it to be due to disease of the teeth or palate. He would, on a future occasion, give particulars of four or five cases in which pus had traveled to considerable distances through the bony canals of the skull, and he thought he should be able to convince Mr. Sewell that what he had supposed to have occurred in this case was neither impossible nor improbable.

Mr. Magor showed a left upper wisdom tooth which had been sent by his father for presentation to the Museum. It was very small and deformed, resembling a supernumerary rather than a third molar. The patient, a lady of about forty years of age, had suffered for some time from severe neuralgia of the left side of the head. This tooth was found to be carious; it was extracted and the pain ceased.

Mr. Brown Mason then related the following case: A young man running across a wet lawn slipped and fell with great force, striking the edge of his upper incisors on the edge of a stone step. When he came to Mr. Mason the left upper central was found to have been driven quite up into the alveolus; the right central had a portion of its crown broken off; the outer plate of the alveolus was fractured from canine to canine; the left lateral, although still in its socket, was so loose as to threaten to fall out on the slightest touch, and the other incisors were very loose. Mr. Mason brought down the central incisor with a pair of forceps, and obtained a very fair impression of the whole upper jaw in godova wax, taking care that the teeth should not leave their sockets during the operation. He then made a temporary splint of the same material to keep the teeth in place during the three hours necessary to produce a splint of celluloid. This was made to fit closely to the lingual and labial surfaces of the incisors and canines, and passed back and round the last tooth on each side of the jaw; it was retained by ligatures tied to the second biscupid on one side, and to the first (the second being absent) on the other. The accident occurred on February 18th, and the patient had since progressed very satisfactorily; of course, he was still wearing the splint, and would continue to do so until the teeth were quite firm in their sockets.

The President then called upon Dr. Lauder Brunton to read his paper.

ON NERVOUS DISEASES CONNECTED WITH THE TEETH—BY T. LAUDER BRUNTON, M. D., F. R. S.

Mr. President and Gentlemen:—The pain of toothache localized in a decayed tooth is unfortunately so common that every sufferer diagnoses it for himself, and although it may be reckoned among the nervous disorders connected with the teeth, I need not say anything about it.

But toothache may be associated with other pains, or may even be replaced by them, and then the diagnosis is by no means easy. The true cause of the pain may, indeed, remain unsuspected even by competent medical men, and their treatment may consequently be comparatively ineffectual. My attention was first drawn to the connection between decayed teeth and nervous disorders having little or no apparent relation te them dy an incident which occurred a good many years ago, when I was a student. I had just heard that one of the best means of relieving toothache was to insert a pledget of cotton wool, dipped in melted carbolic acid, into the cavity of the aching tooth, care being of course taken to squeeze out the superfluous acid and to cover the pledget with some clean wool so as to protect the tongue. I was very anxious to test the information I had received, and shortly afterwards an opportunity presented itself. A maid servant had complained for several days of headache in the left temple of a severe neuralgic character, and associated with this was a certain amount of toothache, which was, however, less complained of than the headache. I plugged the offending tooth with cotton wool dipped in melted carbolic acid, but was greatly disappointed to find that it produced little or no apparent benefit. In less than half an hour, however, the girl informed me that the pain in the temple and the toothache were both entirely gone. Their disappearance was not due to the carbolic acid having acquired time to exert its action, but to its having been applied to a different point. The girl had taken it out of the cavity of the decayed molar into which I put it at first, and transferred it to another tooth, of which she had not complained, and which I had not suspected. Immediately the pain disappeared, both from the tooth and temple.

In this case the pain was felt in the tooth as well as the head, and the headache might be looked upon as simply irradiation of the pain from the tooth. But the headaches may occasionally depend upon caries of the teeth in which no pain whatever is felt, is, I think shown by what once happened in my own case. I had been suffering from migraine, the pain being limited to a spot in the left temple. There was tenderness on pressure on one spot below, and in front of, the parietal eminence. On several occasions I had noticed that the left eyeball was tender on pressure; but one day I was suffering from headache, and yet found that the eyeball was not tender. I pressed my finger all over my face in the endeavor to find a second tender spot, and at last I found one under the angle of the jaw. But the tenderness here was due to a small gland, which was hard and painful to the touch. Hardness, enlargement and tenderness in a gland generally indicate more or less inflamation in it, and the most probable cause of such a condition is, of course, the irritation excited in the gland by foreign matter conveyed to it by the lymphatic vessels. I accordingly began to examine the mouth and teeth from which the lymphatic vessels proceeded to the gland in question. Nothing abnormal was to be noticed in the lips, cheeks, tongue or gums, so I tested the teeth by percussion with a blunt steel point, and on the posterior aspect of the last molar on the left side of the lower jaw I found a spot which was very slightly tender. I accordingly went to a dentist, and learned that caries had just begun at that spot, but had not caused any cavity whatever. I had never suffered the least pain in the tooth, and but for the headache which led me to percuss the teeth systematically, I should, in all probability, never have suspected the caries until it was far gone. The connection which was here found to exist between temporal headache and a decayed tooth is, I think, interesting, not only as showing a casual relation between the caries and the headache, but as helping to explain the phatology of migraine.

A good deal has been written on this subject, and there is a considerable diversity of opinion amongst different writers. Professor Du Bois Reymond, who suffered a good deal from it, attributed it to spasm of the vessels for he found that, during the pain, the temporal artery became terse and hard, like a piece of whip cord, and the pupil of the eye on the affected side dilated as if the sympathetic in the neck had been irritated Others have discarded this explanation, because they found that the vessels, instead of being firmly contracted, were distended widely and throbbed violently, and they have attributed the pain in the head to the congestion of the vessels.

These two explanations of the pain of migrain, the one attributing it to anæmia, and the other to congestion, are apparently irreconcilable. My own case gives, however, I think, an explanation of the discrepancy. Both statements are correct, but both are incomplete, and the reason is that their authors have only observed the arteries during a part of their course, instead of tracing them backwards to the large trunks from which they sprang and onwards to their smaller ramifications. In my own case, I have found that on some occasions the temporal artery was hard and contracted like a piece of whip cord, as described by Du Bois Reymond. On others I found the temporal artery widely dilated and pulsating violently, and yet I could distinguish no defference between the pain I felt on these different occasions. So not contented with noting the condition of the temporal artery only at its middle, I followed it onward to its smaller branches and backwards to the cartoid.

Then I found that a constant vascular condition existed during the headache, notwithstanding the apparent differences in the state of the temporal artery. This constant vascular condition consisted in dilation of the artery at its proximal, and spasmodic contraction at its distal extremity. The carotoid artery was almost invariably dilated and throbbing. Sometimes the dilation would extend as far as the trunk of the temporal artery, but sometimes the temporal was contracted. Even when the temporal artery was dilated, if one only followed it to its smaller ramifications, they were found to be firmly contracted and cord-like. If one may reason from this singular instance, connecting as it does the examples of vascular dilation and contraction given by other authors, we may say that the pain of migraine depends neither on contraction nor dilation of the vessels *per se*, but upon dilation of the one part of the vessel with spasmodic contraction of another, or, if we might so term it, upon a state of colic in the vessels themselves. This irregular contraction of the vessel is almost certainly due to disordered vaso-motor innervation. The cause of this disorder is to be sought in the sympathetic systsem, and the observation of Du Bois Reymond regarding the condition of the iris may lead us to connect it with the cervical ganglia. From these ganglia vaso-motor fibres proceed along the car otid and its branches, and if we regard disorder of these ganglia as the cause of migraine, we are at once in a posiition to explain some of the symptoms which occasionally accompany it. Thus, I have observed that sometimes the pain in the temple would suddenly cease and be replaced by pain in the occipital region. Sometimes, also, we have affections of the sight, such as general dimness of vision, diplopia and spectra—colored or uncolored. The transference of pain from the temple to the occipital regoin is probably caused by transference of the spasmodic contraction from the temporal to the occipital artery, and the disorders of the sense of sight we may reasonably regard as caused by alterations in the intercranial branches of the carotid, similar to those which we can detect by the finger in its temporal branch. The disturbance in the sympathetic system which I regard as the curse of migraine, may not always have its origin in the teeth ; it may, and very probably does, sometimes originate in the eyes, but in the instance I have already noted as occurring in my own case, the irritation started from the lymphatic gland, on or about which branches es of the sympathetic probably ramified. The tooth itself, although the real cause of the sympathetic irritation, did not produce it directly, but indirectly. From the root of the tooth the lymphatics conveyed irritating matter to the gland, and the irritation here excited acted in its turn as a disturber of the sympathetic nerves which furnish the vasomotor supply to the carotid and its branches.

The connection between dental caries and neuralgia was first noticed by Neucourt, and he gives rules for diagnosing a casual relation between caries and neuralgia. When the pain, which is at first widespread, gets localized in the course of a few days in the dental region, and is succeeded by redness, swelling tenderness on pressure of the gums, the neuralgia is almost certainly of dental origin. In these cases the patients are restless, and the pain is more or less constant, with no distinct intermissions; the pulse is more frequent and hard, and there is not unfrequently sweating. If the pain is followed by a gumboil, the tooth, he thinks, is certainly decayed, although it should present no appearance of caries, and this he considers to be also the case if the tooth appears to be longer than the others and is painful on percussion. Tenderness on percussion is considered by Richter to be the most certain sign. The diagnosis may be assisted by noticing whether the neuralgia when disappearing lingers longest in one of the teeth.

The exact pathology of neuralgia has not yet been settled, but Valliex, one of the great authorities on the subject, gave as its distinctive points the presence of spots which were tender on pressure and the effect of pressure in increasing pain. These spots have been noticed by Neucourt in neuralgia depending upon dental irritation, and he has also observed the absence of increased pain on pressure in true neuralgia, so that no distinction can be drawn between neuralgia due to dental irritation and neuralgia depending upon other causes.

Although the most frequent seat of pain due to carious teeth is the temporal region, yet as one would expect, we find it also in parts of the neck. A few weeks ago I was consulted by a lady regarding her throat. She had pain opposite the upper part of the thyroid cartilage on the right side and thought that she had inflamation at that point. Laryngoscopic examination showed the larynx to be perfectly healthy, but I found one of the molars on the same side as the painful spot to be extensively diseased. The pain from which she suffered, I have little doubt, was caused by the decayed tooth, but, as she refused to have it extracted or stopped, I could not absolutely verify my diagnosis. I put her upon a course of tonics and the pain almost completely disappeared.

This would be said by some to prove my diagnosis to be wrong; for if the pain depended on the presence of a carious tooth, how could it disappear while the tooth remained unattended to? But we must always remember that the actions which take place in the animal body are not so simple as those which occur in the test tube of a chemist. Yet, even in the test tube we require more than one reagent to produce a reaction; and if one of the substances or conditions necessary for the reaction be absent, it does not occur, even though other conditions be present. In the same way we know that a decayed tooth does not always cause toothache, and that toothache, when present, may frequently be removed by the use of a saline purgative. the tooth still remains as a source of irritation, but the state of the nervous system has been so altered by the purgative that pain is no longer produced by the irritation. In the same way we may not unfrequently relieve the neuralgia, originating from decayed teeth, by a judicious course of aperients and tonics. This is so far advantageous to the patient, as it relieves him from pain: but it is, on the other hand, disadvantageous, in as much as it causes the medical man to overlook the real source of evil, and allows the dental caries to proceed, instead of having it arrested by suitable stopping. In the case I have just mentioned, the pain in the larynx, which I attributed to the decayed tooth, did not lead to any change in the nutrition or functions of the larynx. Pointis, however, records a case in which after severe toothache, the patient suddenly lost his voice, and the aphonia was followed by anorexia, cough, wasting and feverishness, which led to the belief that he was suffering from laryngeal phthisis.

But the lungs were sound and there was no tenderness over the larynx. There was slight inflamation of the pharynx and all the molars on the left under-jaw were decayed, and the gums and periosteum around them were swelled. The teeth were removed, the gums cauterized, and the gargles employed. On the very day the teeth were extracted, the suffocative spasms which had troubled the patient abated; on the following days the other symptoms quickly disappeared.

The irritation caused to the larynx by the process of dentition is well recognized, and has led to the employment of the term teething-cough. The existence of a real casual connection between cough and teething has been doubted, but there are cases on record that seem to show that this really does exist. One very marked instance of this sort has been recorded by Paasch. A child, four months old, had a paroxysmal laryngeal cough, during which it was nearly suffocated, opening its mouth and throwing the head back. Narcotics were of no use. The gum of the lower jaw was swelled, and vesicular swellings appeared at the part of the gums corresponding to the middle incisors. These increased in size, and became dark, livid, translucent and fluctuating. During their growth the cough increased, but when the right incisor came through the gum, and one vesicular swelling broke, the cough ceased. After twenty-four hours it again began, though less violent than before. After some days the second incisor came through, the second vesicle burst, the cough at once began to disappear, and at the end of two days had entirely and forever gone.

From the close connection that exists between the throat and the ear we would expect deafness to be not unfrequently the consequence of dental irritation. It seems, however not to be very frequent, although it does exist, as shown by the following case, recorded by Koecker. A man, aged forty-eight, suffered from suddenly increasing deafness, but after his teeth, which were carious, and caused supportion, were extracted, he completely regained his hearing.

The eye is much more frequently affected than the ear, and blindness is by no means an uncommon result of dental decay. Mr. Jonathon Hutchinson has recorded some cases of this, and he regards the blindness as reflex, and analogus in its causation to essential paralysis of children. The sight is suddenly lost but there are no cerebral symptoms. The optic nerve is sometimes athropied, but sometimes not. The blindness is generally preceded for a long time by facial neuralgia, associated with toothache. A more striking case than any of Mr. Hutchinson's is recorded by Dr. De Witt. A perfectly healthy man, aged thirty-one, suddenly noticed, in attempting to fire off a gun, that his right eye was completely blind. He had neither pain nor subjective appearances of light in the eye. He was able to distinguish light from darkness with it, but nothing more. No cause for this blindness could be discovered until twelve years afterwards, when it was found that the patient had several teeth stopped two months before his blindness. For a long time afterwads he suffered from pain and tenderness in the first molar of the right side. The gums swelled and ulcerated, and frequent abscesses formed, which he opened with his knife. The stopping was at length removed from the tooth, and this at once relieved the irritation of the gums and increased the power of sight. In three weeks, however, when the sight had become considerably better, the gums again ulcerated and the sight became immediately worse. The decayed tooth was then extracted and the sight became permanently improved, although it never became quite so good as that of the other eye.

The connection between the teeth and the sight has long been popularly recognized in the name of "eye teeth" given to the cannies, and this seems to depend on no popular superstition, but on a real scientific fact. It is believed by many that the extraction or decay of a canine leads to loss of sight, or inflamation in the corresponding eye, and the physiological experiments of Magendie and Schiff substantiate this belief.

Magendie divided the inferior maxillary branch of the fifth, and Schiff divided the lingual and inferior dental branches, without injury to the ophthalmic branches. The dimness of vision produced by these experiments is referred by Schiff to disturbance of the vaso-motor supply to the eye consequent upon a partial analysis of the ophthalmic branch of the fifth; but as this nerve itself is not injured in the experiment, it is evident that the vascular alterations are of reflex origin, the irritation having been conveyed from the sight of the wound to the nerve centres, and having there exerted such an influence upon them as to induce vascular changes in the eye.

The eyelid may also be affected reflexly from the teeth. Sometimes dental irritation may cause motor spasms, and at other times paralysis. A year or two ago I had the stump of a bicuspid tooth extracted from the right upper jaw. Almost immediately after the extraction I noticed a con stant spasmodic twitching in the right eyelid, which I was utterly unable to restrain. This lasted all the time the wound in the gum caused by the extraction of the stump was open, but it ceased as soon as the gum had healed and has never since returned. A case is recorded by Gaine in which a carious tooth in the upper jaw had caused an abscess in the antrum. The right upper lid was paralyzed, the pupil dilated, and there was no reaction. The optic nerve was pale and the eye blind. On extraction of the tooth and puncture of the antrum the paralysis of the lid disappeared, although the eye did not regain sight.

Spasmodic contraction of the masseters is another consequence of dental irritation. A few weeks ago a gentleman, over forty years of age, called upon me, and told me that he was much concerned about a spasmodic affection of the jaw from which he was suffering. He was, in fact, afraid of lockjaw. He felt obliged to keep his mouth open, because it seemed to him that if he once shut it he would not be able to open it again. I did not recollect having read any description, but it seemed evident that it must depend either upon congestion of the cerebral centre for the movement of the jaw, which Ferrier locates at the lower end of the fissure of Rolando, or on reflex irritation from the mouth itself. The latter seemed to be much the more probable, and on looking into his mouth I saw that the teeth did not seem to be altogether in good order. I accordingly requested him to see a dentist, and on inspection the source of irritation was discovered to be a wisdom tooth, which was just making its way through the gum, but in a somewhat oblique direction, so that its crown was pressed against that of the molar in front of it. On looking up the literature of the subject, I discovered that this affection was pretty fully described by Germain, who recognized two causes for this orm of trismus. The first is when the back molar is decayed and a gum-boil forms at its base, and the other is when the attachment of the masseter extends in front of the angle of lower jaw and wisdom tooth, in appearing must break through its muscular and fibrous attachment. Colin states that every year he sees at least one perfectly healthy individual become suddenly affected with spasmodic contraction of the masseters. There is no fever, but the contraction is so strong that only fluid nourishment can be taken. The contraction can be felt by running the finger over the masseter muscle. It gradually disappears in about eight or fourteen days. Little treatment is required, except attention to the bowels, and possibly, if the contraction be very severe, an injection of atropia into the muscular substance itself might be of service.

We have already noticed paralysis of the eyelid as a consequence of dental irritation, and we have also discussed the pathology of temporal and occipital headache in relation to caries of the teeth. Sometimes, however, paralysis occurs of a much more extensive character, in consequence of dental irritation, especially in children. Teething is recognized by Romberg and Henoch as a frequent case of analysis appearing in children without any apparent cause. According to Fliess, paralysis of this sort occurs more commonly during the period of second dentition, whereas convulsions generall occur during the first. Its onset is sudden. The child is apparently in good health, but at night it sleeps restlessly and is a little feverish. Next morning the arm, or more rarely the leg, is paralyzed. The arm drops; it is warm but swollen, and of a reddish blue color. It is quite immovable, but the child suffers little or no pain. Not unfrequently paralysis is preceded by choleric movements. Sometimes recovery is rapid, but at other times the limb atrophies, and the paralysis may become associated with symptoms indicating more extensive disturbance of the spinal cord and brain, such as difficulty of breathing, asthma, palpitation, distortion of the face and squint, ending in coma and death.

It is only in very rare instances that we are able to gain any insight into the pathological anatomy of such cases, because they rarely prove fatal, and even when they do so, the secondary changes are generally so considerable as to leave one in doubt as to the exact mode of commencement. This renders all the more valuable the case recorded by Fliess, in which a boy five years old, and apparently quite healthy, found his left arm completely paralyzed on waking one morning after a restless night. The arm was red, but the boy suffered no pain, and played about without paying much attention to the arm. The same day he fell from a wagon upon his head and died in a few hours. Apart from the fracture on the skull, which caused his death, the anatomical appearances which were found, were congestion of spinal cord near the point of origin of the bronchial nerves; the meninges were here much reddened and congested; the veins were much fuller than the corresponding right side. There was no organic change perceptible, either in the spinal chord or the bronchial nerves. On the other hand, the turgesence of the veins extended from the shoulder and neck up to the face, and was very striking in the submaxillary regino.

This vascular congestion seems to point to vaso-motor disturbance of a similar kind to that which we have already noticed in connection with occipital headache, or with migraine accompanied by subjective appearances of either form or color. Chronic movements, as we have said, have been noticed as prodromata of paralysis, and occasionally dental irritation may give rise to cholera alone. This irritation may depend, according to Levick, either upon the sound dentition, or upon dental caries, and the casual connection between the two is shown by the fact of it disappearing when the tooth pierces the gum, or when the carious teeth are extracted.

According to Russell Reynolds, the second dentition is also a cause of epilepsy, and he has observed that those who are affected by it have often suffered from convulsions during the first dentition. A case is recorded by Albrecht of a boy, aged twelve, who suffered daily for twelve months from general convulsions, which began in the temporal region and extended to the external auditory meatus. There was no decay in this instance, but the teeth were large, and the last molar on the right side had its crown jammed into the ascending ramus of the jaw. As soon as it was extracted the pain ceased, and the convulsions did not return. Another case is given by Mr. Castle of a young man, aged nineteen, who had complained for four years of headache and pain in the eyes, stiff neck, swelling and numbness of the right arm. For the latter two years he suffered from general convulsions, which came on every two or three days ending in vomiting, and often succeded by partial deafness. All treatment was useless, and setons and blisters to the neck did no good. Nearly all the teeth were decayed; nine of them were extracted, and almost all of them had matter at their roots. A gargle was given with five grains of iodide of mercury twice a day, and a purgative twice a week. After the extraction of the teeth the fits entirely disappeared.

Affections of the intestinal track depending on dental irritation are of very considerable importance indeed. The diarrhœa which comes on in children during dentition is well known, and is probably of a reflex character.

In adults many a case is due to defective teeth, partly, it may be, from a reflex affection of the nerves, both secretory and motor, of the stomach and intestines, but partly also, without doubt, from the imperfect mastication of the food, which is swallowed without being broken up on account of the pain or inconvenience which the act of mastication causes. In this way two evils are occasioned. First of all, the shortened sojourn of the food in the mouth allows no time for the secretion of saliva. From want of this the starchy constituents of the food are imperfectly digested; and, moreover, deficiency of saliva also lessens the normal stimulus to the secretion of the gastric juice; for alkaline fluids, like saliva, stimulate the secretion from the stomach, and this deficiency of saliva is accordingly followed by a deficiency of the gastric juice. But, secondly, imperfect mastication has a mechanical action in preventing perfect digestion, for the food, being swallowed in lumps, is not permeated by the digestive fluids, and thus cannot be dissolved in anything like the same period of time that it would otherwise be. The diarrhoea which occurs in children is probably produced through the gastric and intestinal branches of the vagus, and other branches of this nerve may be affected reflexly from the teeth. In a case recorded by Lederer, the second left upper incisor was replaced in a young girl by an artificial tooth. Shortly afterwards she became ill, vomited everything, and suffered from convulsions. No remedy succeeded until the tooth was removed and shortened. Immediately all the symptoms from which she had suffered disappeared.

The close connection between the roots of the fifth nerve, and those of the vagus, can be demonstrated anatomically, and it is probably in consequence of this that irritation of the fifth is able to exert such a powerful influence upon the circulation. Some time ago, in a paper which I published in the *British Medical Journal*, I mentioned that the cause of death during the extraction of teeth under chloroform, was probably the stoppage of the heart's action through the inhibitory fibres of the vagus, associated with a reflex depression of tone in the blood vessels. The reason why the extraction of a tooth in a person who is not under the influence of anæsthetic is followed by no ill effects, is probably this: that in him the irritation of the fifth nerve produces two distinct actions which counterbalance each other. It may cause reflex stoppage of the heart through the vagus, but at the same time it causes reflex contraction of the vessels through the vaso-motor centre. This contraction of the vessels maintains the pressure in the arterial system during the stoppage of the heart and thus no harm whatever is done. When anæsthetic is used, however, one of these pieces of nervous mechanism may be paralyzed by it, while the other is not, and the extraction of the tooth may stop the heart without causing contraction of the vessels. The blood-pressure will then sink very rapidly in the arterial system, and fatal syncope may be produced. If, however, the anæsthetic be pushed to a greater extent, so that both parts of the nervous mechanism just mentioned are paralyzed, the vessels are not contracted; but neither is the heart stopped. The operation, is therefore, comparatively free from danger when no anæsthetic has been given, or when the anæsthesia is perfectly complete, the period of danger being that of imperfect anæsthesia.

We have seen how affections of sensation, of motion, and of nutrition may all be dependent upon dental irritation, but even the cerebral faculties themselves may also suffer from a similar cause. One or two very interesting cases of this sort are recorded by Dr. Savage in the *Practitioner* for June, 1876. The first of these was that of a farmer, aged twenty-two, with a strong family tendency to insanity. In May, 1875, he suddenly took to riding madly about the country without his coat or waistcoat. From May until November he was exceedingly noisy, destructive, untidy, almost constantly excited, and if for a day or two he was exhausted, he was sullen and more dangerous. In the middle of November he complained of very severe toothache that caused him to be sleepless. He bore this for two or three days, after which the stump was removed. There was suppuration at the root of the fang. From the time that the stump was extracted the patient steadily improved, and by the middle of December was quite well. Another case was that of a woman, aged thirty-four, who had a brother insane and had herself been intemperate. She was admitted in September, 1875, suffering from acute mania. She was noisy, violent and obscene. She continued to be so until January 20th, 1876, when she complained of great pain, with swelling and redness of her right lower maxilla. She had some bad teeth, but did not complain of toothache. The pain and swelling increased, and at the same time she became quiet and reasonable. She said she could not remember much of her state of excitement. The swelling of her face subsided and she remained quite well. This case, however, was not so convincing as the first one recorded, because here there was a second possible cause of recovery, as she was pregnant, and said she felt quickening about ten days before her recovery. The recovery, however, was coincident with the pain and swelling of the face, and seemed, rather than the quickening, to be the cause of the recovery.

The President said he thought members of their profession might congratulate themselves on the fact that medical men now paid more attention than formerly to the effects of local irritation. He had met with many cases in which the patient might have been saved much suffering had some of the facts to which Dr. Brunton had called attention been more generally known. He remembered especially the case of a gentleman whose health had been greatly impaired by severe neuralgia so that when he came to Mr. Woodhouse he was reduced to living on brandy and milk, and was miserably thin and weak. Mr. Woodhouse found that both upper canines were carious, the pulp of one being exposed and inflamed, though the patient never had any pain in it; the other was not so bad. He destroyed the pulp of the one and filled the other. The patient had no pain afterwards and soon regained his health. He hoped that Dr. Brunton's paper would again draw the attention of medical men to this important subject.

Mr. Charles Tomes said he wished in the first place to ask Dr. Brunton a question. He had referred in his paper to some experiments which had been performed by Prof. Schiff, in which he found that irritation of the branch of the fifth nerve supplying the teeth produced a reflex effect on the eye of the same side. Mr. Tomes would be glad if Dr. Brunton could inform him on what animals these experiments were tried and in what way the impairment of vision was tested. The correctness of these observations was of some practical importance, since division of the inferior dental nerve was a recognized surgical operation which was practiced as a last resource in cases of obstinate neuralgia. He had performed the operation a good many times and had never known it to be followed by dimness of vision, but if it should appear that there was some risk of this occurring, of course the operation must be abandoned.

Then, with regard to the general pathology of migraine. Dr. Brunton had advocated the view that it was due to spasmodic contraction of the vessels. If this were so, the pain should always be relieved by nitrate of amyl, but this was not invariably the case, even though the nitrate was so administered as to produce extreme vascular relaxation. The inhalation of ether again produced great vascular relaxation, evidenced by flushed face, full bounding pulse, etc., but on one occasion he had distinct evidence of the occurrence of an attack of neuralgia whilst the patient was fully under the influence of ether. This was in the case of a man who suffered from very severe paroxysmal attacks of neuralgia affecting the region of the inferior dental nerve and always accompanied by a spasmodic twitching of the lip. Dr. Tomes first tried stretching the nerve at the mental foramen, and as this gave no relief, he cut down upon it again and removed a portion. During one of these operations, whilst the patient was fully etherized, the peculiar twitching of the lip occurred which indicated a paroxyism of neuralgia.

Lastly, Dr. Brunton had quoted some German authority who asserted that the spasm of the masseter which was not unfrequently set up by the wisdom-teeth during the process of eruption, was caused by the tooth tearing through the fibrous attachment of the muscle, and that it was thus due to direct, and not to reflex, irritation. But the tooth, if erupted in the usual situation, did not approach anywhere near the masseter: and if the tooth was displaced outwards, the external plate of the jaw was so exceedingly thick and hard, that the tooth on coming into contact with it, was always diverted from its former course. He thought, therefore, that the view usually held, viz., that the spasm was of reflex origin, was more likely to be correct.

ical Press and Circular. It should be remembered that

Mr. Sewill thought that the Society was to be congratulated on the fact that it would have in its "Transactions" the best account of the connection of the teeth with nervous disorders which had yet been published. Dr. Brunton had collected from various sources some remarkable cases of serious disorders of the nervous system resulting from dental irritation, but he himself had been greatly impressed by the extreme rarity of such cases in practice. He had been for twelve years dental surgeon to a metropolitan hospital; he had seen during that time not only a large number of patients who had applied to him directly, but had also had a considerable number of patients referred to him by his medical and surgical colleagues, and he had kept careful records of all exceptional cases. Yet among all these cases he had not met with a single case of nervous disorder which could be said to be directly dependent on diseases of the teeth. Some nervous diseases such as epilepsy, might be aggravated by dental irritation, but as to the direct result of this he had met with nothing more serious than neuralgia and spasm of the masseter. He had not even met with a case of distant neuralgia which could be assigned to this cause; the pain was, in his case, always confined to the head and face. He might remark, also, that Dr. Brunton's personal experience was exceptional; *incipient* caries rarely produced neuralgia; its occurrence generally indicated the existence of a large cavity. Nor did he think that incipient caries would cause enlargement of a lymphatic gland. If this was present, inflammation of the pulp, alveolar abscess or periostitis would almost certainly be found. On the other hand, there was no doubt that dental neuralgia might intermit, although the exciting cause was still present, and also that it could be cured, temporarily at least, by tonics. An interesting case of spasm of the masseter, caused by dental irritation, had lately been related by the President of the College of Surgeons, of Ireland, at a meeting of the Surgical Society of Ireland, and would be found reported in the *Med-*

a plate by an epileptic was dangerous, he did not remove inflammation of the parts about the jaw might cause a stiffness which would closely resemble spasm of the masseter, and, as a matter of fact, inability to open the jaw was more often due to inflammatory changes than to nervous spasm. The remarks he had made respecting the rarity of severe nervous symptoms as the result of dental irritation referred only to adults. In infancy grave nervous disorders did no doubt occur not unfrequently from this cause, but dentists did not as a rule see much of this class of cases.

Mr. Coleman said he was surprised to hear that Mr. Sewill had never met with cases of nervous derangement which were due to dental irritation. He himself had published several very clear cases in the *Lancet* some years ago and had seen many since. Quite recently a little girl was brought to him who had become subject to fits; he removed some carious teeth and the patient had no more fits. The late Mr. Holmes Coote had assured him that talipes equinius was more frequently due to nerve irritation set up during teething than to any other cause. He would take the opportunity of thanking Dr. Brunton for his paper, which, if it did not set forth any new facts, certainly gave a more scientific explanation of the pathology of these cases than had yet been attempted.

Mr. Gaddes said he had lately met with a case which showed clearly the effect of dental irritation in aggravating nervous disease. A girl, aged seventeen, came to him at the National Dental Hospital; she had been subject to epiliptic fits for two years, and when she came to him she was having on an average two a week. There was no family history of epilepsy. Some of the bicuspids were much broken down by caries and had decomposing pulps. Some time previously she had broken her upper central incisors in one of the fits, and the pulps of these teeth also were exposed and suppurating. As the girl had some pretensions to good looks, which would have been materially affected by the extraction of the teeth, and the wearing of them, but cleared out and filled the pulp canals. The result of this treatment was that during the next three months the girl had but one fit, showing an evident connection between the state of the mouth and the fits.

The President here called attention to the fact that the hour at which the meeting usually terminated had almost arrived. He thought, however, that considering the interest and importance attached to the subject under discussion, the members present would probably wish to prolong the debate for another half hour.

A motion to this effect having been proposed and seconded by Mr. Oakley Coles and Dr. Walker, was put to the meeting and carried unanimously.

Mr. Oakley Coles said he thought every dentist must have met with cases like those referred to by Mr. Coleman and Mr. Gaddes. Not long since a girl was brought to him who had become subject to epileptic fits; he extracted two very carious teeth and had no fit since. He was much surprised to hear Dr. Brunton's report of the result of Prof. Schiff's experiments on the inferior dental nerve. He himself had never known any impairment of vision follow its division. He remembered a case in which the late Sir William Fergusson divided this nerve fourteen times on the same patient; after each operation the man obtained relief from pain for some weeks, or even a few months, and he certainly never made any complaint of dimness of sight.

Dr. Walker said he had seen many instances of the serious effects of dental irritation on the nervous system of young children, especially when they were weakly or had a scorbutic tendency. He would especially instance one family, all the surviving members of which had been for some years past constantly under his observation. The first three children died during the period of first dentition; after this, orders were given that the others should be taken to the dentist as soon as they were six months old, and afterwards whenever they suffered any little indisposition. Since these regulations had been carried out seven children had been successfully reared. The children were brought to him directly any symptoms of irritation showed themselves; he never lanced the gums, but scarified them freely with a sharp point. On several occasions the good effects of this treatment had been most marked. For example, the father going home to his country-seat, on Saturday, noticed that one of the children squinted; he was sent to Dr. Walker on Monday, the squint still persisting, but next day it had entirely disappeared. Another child lost the use of one leg for three days; the gums were scarified and he was well again directly.

About nine years ago a child was brought to him who had been for some time subject to epileptic fits. Her general health was very bad and her teeth much decayed. She remained under treatment fifteen months, and as the mouth was got into better order the fits gradually disappeared, and she had since turned out a very clever girl.

A member said he had met with a very similar case. A boy, aged nine, was brought to him by his mother, who stated that he had suffered for ten months past from frequent fits. On examining the patient's mouth, he found that the second dentition was backward; a lower molar was also decayed, though not much, still the boy said he had suffered occasional pain in it. He filled this tooth and removed the deciduous left lower lateral and canine. A fortnight afterwards the patient returned much improved in health and from that time had no more fits.

Mr. F. Canton said he should like to ask Dr. Brunton whether he thought that paralysis of the arm or leg could occur in an adult as the result of dental irraitation? He had met with a case in which pain in a lower molar had been accompanied by spasm of the muscles of the arm and leg, followed by partial paralysis. As the patient was an anæmic young lady, and the effects seemed disproportionate to the cause, he looked upon the affection as being due to hysteria. At the same time he took care to impress upon the patient the idea that the tooth was the cause, and that its extraction would be followed by a complete disappearance of the paralysis. This did actually come to pass, but he did not feel at all sure as to the mode in which the cure was affected.

Mr. J. S. Turner said his own experience enabled him to answer Mr. Canton's question in the affirmative. About two years ago a gentleman, aged twenty-eight, was brought to him from the country. The patient came into his consulting room held up on either side by his father and brother, being unable to walk, and sometimes even to stand, without this assistance—he had also severe trismus. The cause of all this was a lower wisdom-tooth which had grown horizontally outward, perforating the strong outer plate of the maxilla, so that the crown was imbedded in the substance of the masseter. The patient was a stout, healthy man of somewhat nervous temperament, but certainly not inclined to hysteria. The tooth was removed with considerable difficulty, and the patient made a speedy and complete recovery.

The following case was also interesting from the difficulty of the diagnosis, the usual order of things being reversed. A lady consulted him on account of periodical attacks of most intense left hemicrania; any great excitement would bring on an attack—as, for instance, when her husband came home from sea—and whilst the pain lasted she was obliged to shut herself up in a dark room, and was unable to see anybody or do anything. She had a most splendid set of teeth and had never suffered the least pain in any of them, but the wisdom teeth were only partially erupted, and as on careful enquiry the pain appeared to be ultimately referred to the upper dental region, Mr. Turner suspected that the left upper wisdom tooth must be the source of irritation. He therefore removed it, and found that it was carious on the buccal surface, the disease having been hidden by the gum. From that day the patient had no more neuralgia.

Mr. Dennant said that had it been necessary he could have confirmed from his own experience nearly all that Dr. Brunton had said respecting the effects of dental irritation on the nervous system, but as so much had been said on this subject he would relate a case that would warn members not to confine their search for decayed teeth as the cause of neuralgia of the head and face, since irritation of other cranial nerves might by reflex action produce very similar results. A lady, of middle age, consulted him on account of severe neuralgia of the head and face, which she thought might be due to a diseased tooth; he examined and percussed the teeth, but could find nothing. A paroxysm of pain came on during the interview, and the patient at once asked if there were any flowers in the room, adding that the smell of flowers always had this effect. There were some roses on the table at the time. Any irritation of the olfactory nerve would bring on the pain—even the smell of smoke. Mr. Dennant recommended mountain air, and she then said that she had suffered in a somewhat similar manner fifteen years before, and that the same advice was then given to her, and that she had derived great benefit from the change.

Mr. S. J. Hutchinson said he should like to ask Dr. Brunton three questions:—(1) Had he any experience of tincture of Hamamelis in the local treatment of facial neuralgia? (2) He had understood him to say that the inhalation of chloroform in small quantity was apt to exert a depressing effect on the action of the heart, but that when given in larger amounts the effect was counterbalanced by contraction of the small arteries: how did the action of nitrous oxide differ from chloroform in these respects? (3) He had referred to the fact that purgatives would cure neuralgia: could he give any explanation of the way in which this was effected.

The President having called upon the author of the paper for his reply,—

Dr. Brunton said that as the time at his disposal was very short he could only deal briefly with the most important of the questions which had been put to him—those especially requiring an answer.

He could not then reply to Mr. Tome's first question, for he had been unable to obtain a copy of the original paper by Prof. Schiff, but he hoped to be able to get one in a few days, and would then give Mr. Tomes the information he required. Mr. Tomes doubted his explanation of the pain of migraine, because nitrite of amyl did not relieve it, although it produced relaxation of the vessels. But the fact was that the nitre did not uniformly dilate; it could not dilate a vessel which was contracted by the irritation of a vaso-motor nerve. Hence, although it produced great *general* vascular relaxation, it might not be able to suspend the reflex action of the vaso–motor nerves, and the *local* contraction due to this cause would persist. The same thing probably occurred during the administration of ether, but this he could not positively assert.

He would admit the justice of some of Mr. Sewill's criticisms, and would make some verbal alterations in his paper before it was printed.

In answer to Mr. Canton, he would say that dental irritation might certainly cause paralysis in an adult as well as in a child. The brain centre which presided over the movements of the hand, and that which governed the mouth, were so closely connected, that excessive stimulation of one centre might easily derange the functions of the other.

With regard to Mr. Hutchinson's question. He had never used the tincture of Hamamelis Virginica for dental purposes; it had been recommended to him as a remedy for the irritation of mosquito bites, and he had tried it, but with very unsatisfactory results. As to the action of chloroform on the heart,—The nerve from the tooth would act upon the vagus centre and upon the vaso–motor centre in the brain. The vagus centre, being irritated, would tend to weaken, or even to stop, the heart's action, but the vaso–motor centre, being equally contracted would cause contraction of the arterioles and thus no fall of blood pressure would occur. But when chloroform was administered its first effect (*i. e.* when given in small quantity) was to paralyze the vaso-motor centre; the action of the vagus being thus left unopposed, cessation of the heart's centre might occur without any simultaneous contraction of the arterioles, there would then be an immediate rapid fall of blood-pressure and fatal syncope might result. Nitrous oxide was opposed to chloroform in that it, or the venous condition of the blood which it induced, acted as a strong stimulus to the vaso-motor centre, and thus the danger from syncope was reduced to minimum. Mr. Hutchinson's third question was one which it would be impossible to answer briefly, since it opened up a very complex and difficult subject, and he would not therefore attempt it.

On the motion of the President, a hearty vote of thanks was given to Dr. Brunton and to the contributors of the casual communications.

The meeting then terminated.

ARTICLE II.

Operative Dentistry.

BY ISAAC J. WETHERBEE, D. D. S.

A compilation of the rules and systems of practice of the "ten thousand" (more or less) practitioners of dentistry in the United States would present a condition of things that would awaken the greatest possible surprise, so diverse are the views of dentists as to methods to be employed to obtain a specific end.

If there was *unity* in this *diversity* a satisfactory personal record would ensure a complete jurisdiction. In the absence of such record we are forced to the conclusion that there is, at the present time, a dearth of scientific knowledge requisite for a skillful practice of dental surgery—knowledge of the true character and functions of dental tissues obviously required—the proper methods of procedure to converse, to the fullest extent, their usefulness.

It appears that late events—events characteristic of the age in which we live—have unsettled, or at least disturbed, the convictions of many, which had matured from long and careful observation. Why this sudden change? One might reasonably suppose that a *messenger of light* from a higher plane had at least condescended to give us a "new dispensation."

Let us in a few brief words examine the *salient points* of this "new departure," and see if there is anything really "new" about it, and if so, in what it consists. It is acknowleged by the chief apostle and other expounders of the "new departure" that in *well organized teeth* gold should be employed as a suitable material. In the "Dental Cosmos" for July, on page 376, we have the *true inwardness* of this latter-day adventure set forth with an unction that is exceedingly refreshing. Hear what it says:

"We desire that you should observe *how little, how very little*, we have asked that you should deviate —at first—in that which is practice from that which is usual practice."

"We say, *fill all you can and do*, SATISFACTORILY WITH GOLD! *It is so stated in the bond!* Can you in turn ask anything more? Why do you desire to fill such teeth as you cannot fill 'SATISFACTORILY' with gold with that material?"

Is there anything "new about that?"

"But the truth is that the 'true inwardness' of the 'new departure' is a very different thing from this. Its design is to teach a principle that shall indicate lack of knowledge as the cause of '*failure in operations*,' instead of attributing it to defective manipulation."

This audacious assumption! this begging of the whole question, especially after ceding the fundamental principles which underlie dental practice as generally understood, is quite enough to make angels weep, if they have *tears to spare* for the washing away o such folly?

We are *advised* to fill all we can satisfactorily with gold. Why? Because gold makes a good and durable filling in the majority of teeth, notwithstanding the *assumed want of compatibility of gold with dentine.* How shall we determine the compatibility of gold with dentine? Because teeth again decay after having been well filled; and from the same cause or causes which produced the first lesion are we to legitimately infer that the chief factor in this newly recurring disaster is to be charged to want of compatibility. Oh consistency, thou art a jewel!

Again, "it is the *little*, yea, *very little* deviation that they have asked at *first* from that which is usual practice." Now, why all this? If gold is radically wrong in the *one case* for the want of compatability, why not in another? And how is it about the *little* departure? Why not away with it at once and make it contraband? The incongruity and fallacy of such teaching is quite enough to indicate a relish for the leeks and onions of Egypt.

The enunciation of the plausible theory of chemico-electro galvanic action produced by gold being in opposition to dentine, and producing decay, has had its day of small sayings, without proofs, and is seeking a retired place for silent *interment*, for the reason that it could not find either godfather or reliable god-mother as sponsors to assume the responsibility of its future well being, as it had no established scientific basis on which to depend.

We are informed that the *true inwardness* of the "new departure" is a very diffeient thing from this. Its design is to teach us *how little we know* of the cause of "failure" in operations. This gratuity on the part of one who was possessed of this specific knowledge for eighteen or twenty years but retained it within his own bosom until recently, is quite overwhelming. At least it seems that his bowels of compassion for suffering humanity were not moved until the fullness of time approved by himself had arrived

Is it not true that dentists in their practice are electic? Have they not, as a general thing, filled such teeth with gold when the quality of the tooth indicated its use? Have they not used amalgam, when in their judgement, the usefulness of the tooth could best be preserved thereby? Have not the oxychlorides and tinfoil had due prominence in the economy of dental practice? When doubt has existed as to saving the teeth by the employment of either of the above materials has not a resort to extraction been a reasonable practice?

It is true that many teeth have been sacrificed in the past, and will be in the future, for lack of knowledge and because of a prudishness as to reputation. Dead men tell no tales (not true, however,) and their escape from implied indiscretion, by reason of the failure of some operations, is a personal satisfaction. It is reasonable to suppose that the employment of the above mentioned materials is due to a conviction that a tooth may be preserved longer and be more useful, and this from a *knowledge* of the *relative conditions* of the case.

It is a generally well known fact that "gutta percha" will preserve a tooth as long as it shall remain intact. Six months or a year will suffice to disintegrate such fillinings the teeth of patients whose oral secretions are viscid. In other and divers cases these fillings will be worn away by attrition within a comparatively short space of time. They must be *frequently repaired.* Each sitting for repairs is an additional expense to the patient, and in the lapse of one decade will aggregate a larger expense than would have occured provided they had been filled with gold in the first instance, to say nothing of the loss of time. Let us not forget or be unmindful of the frequent repair the "new departure" system subjects patients to.

It is my intention in this report to voice the general sentiment of dentists so far as I have been able to obtain their views; and give, as far as possible, an opinion which many years of intelligent practice has confirmed. I believe that no practical man expects to save all the teeth which he fills for a definite period. It is understood that although cavities in the teeth may be filled, *and filled perfectly*, we have little, if any, control over the causes which first produced the local destruction of the dental tissues. Decay may sieze any other portion of the tooth, or, indeed may waste away the enamel and dentine in proximation to the gold.

Again, other teeth, which were not decayed when the above cases were treated, are found, after three or four years decayed, not by the apposition of gold thereto, but as the result of viscid secretions or fluids, and perhaps for a lack of proper care of the teeth. In such cases we have no use for the hypothetical; the evidence is clear and conclusive.

So far as my knowledge and observation extend, there are few converts to the so called "new departure."

I deem it proper in this report to give a brief summary of what may be considered general practice. The *contourist* claims that in good tissue the lost portions should be restored to nearly or quite the normal size, believing that nature, in her economy, is to be followed in order to secure the best practical results. My convictions and practice are in perfect accord with the theory above expressed. Operations of like character performed over twenty years since, are good to-day, and conclusively demonstrate the practicability of this style of practice.

We have the *radical separatist*, who, with file and chisel cuts away both good and poor tissues alike, making no discrimination, leaving the teeth in a sadly demoralized condition. The excuse offered for this is greater facility in operating, larger degree of cleanliness and less liability to decay. In poor teeth this practice is quite justifiable; indeed the condition of the teeth as to quality makes it necessary, as the teeth can only be saved, if preserved at all, by this method. But why extend this practice to good and well organized teeth?

We have next in order the *more moderate separatist*, who is careful to secure a sufficient general separation; but is also careful to give a much wider space on the lingual approximate surfaces, for the purpose of making the space self cleansing, thereby retaining the good appearance of the tooth. This practice so far as conditions may indicate, is to be approved and commended. The surfaces in such cases should be well polished

Gold in the form of *pellets*, if non-cohesive, is well adapted for use at the cervical wall, and in large or small crown cavities cylinders are admissible; by some they are preferred. For the general use of cohesive foil I prefer ribbons, made by folding a sheet of No. 4 so as to make eight thicknesses, and then cut into such sizes as the case shall require. Gold in this form is adapted to cases where but little room for convenient operating is obtained, as it is very portable. The method of impacting, etc. etc., are too well known to be rehearsed in this paper.

Let us consider the claims which some of the "bleachants" now in use have upon our confidence. Chloride of lime, or, more properly speaking, *chlorinated lime*, has been used for bleaching discolored teeth. It has, however, fallen into disuse, for the reason that, although at first its use was satisfactory, future results did not justify its application. Chloride of sodium is open to like objection, from the effect produced upon the calcareous portion of the dentine, as well as upon the soft tissue. A grayish-yellow shade will appear within a short time or at best within a few months.

Strong *spirits of camphor* is an excellent bleachant; it is very effective in a short space of time. It dissolves the pigment within the cells, as well as permeating the hard tissue, leaving no bad results. So much of the dentine should be removed as may be safe to do. The rubber dam should be in position, and the spirits of camphor applied for such time as may be requisite to attain the end desired. Then fill the *root* with gold in all cases. Fill the cavity with great care and thoroughness, and you will be well pleased with your success.

There has not transpired within the past year anything *new* with reference to the best mode of *extracting teeth*, a more effectual method of treating cases of *salivary calculus*, nor a surer method of disposing of *alveolar abscesses.* To extract an abscessed tooth, and then replace it, for the purpose of removing the difficulty, is objectionable practice and should, in my opinion, be abandoned.

[The majority of the section would respectfully dissent from the statement that all roots of the anterior teeth should be filled with gold, believing as they do, that other materials may be used for the purpose more easily and with equal success.

Also, they would state that they regard the replantation of teeth, for the cure of alveolar abscess, as good practice in certain extreme cases.]—*Transactions of Am. Dent. Association.*

ARTICLE III.

Call for a Mass Convention of the Dentists of the United States to organize a National Dental Association.

At their annual meetings in 1879 the Southern Dental Association and the American Dental Convention each appointed a committee invested with full power to adopt measures for the formation of a National Dental Association. The American Dental Association at its meeting in the same year appointed a committee to confer with these two committees on this movement and report to the Association at its meeting in Boston, August 3d, 1880. Members of these committees met at Saratoga in August, 1879, and elected Professor J. Taft General Chairman.

The Committees are as follows:

National Dental Association—R. Finley Hunt, Chairman, Washington, D. C. T. T. Moore, Columbia, S. C. S. J. Cobb, Nashville, Tenn. T. S. Waters, Baltimore, Md. J. R. Walker, New Orleans, La. F. J. S. Gorgas, Baltimore, Md.

American Dental Convention.—R. B. Winder, Chairman, Baltimore, Md. J. G. Ambler, New York, N. Y. F. A. Levy, Orange, N. J. J. Taft, Cincinnati, Ohio. P. Y. Clark, Saratoga, N. Y. C. S. Hurlburt, Springfield, Mass.

American Dental Association.—A. W. Harlan, Chairman, Chicago, Ill. C. N. Pierce, Philadelphia, Pa. F. H. Rehwinkel, Chillicothe, O. H. J. McKellops, St. Louis, Mo.

A Meeting of chairmen was held in New York, May 11, 1880, at which were present Professor R. B. Winder, Dr. R. Finley Hunt, and Professor C. N. Pierce, the latter representing (by proxy) Professor J. Taft, General Chairman. Professor Pierce was also present as a member of the committee of the American Dental Association.

This meeting, in accordance with the powers and duties intrusted to the committees, decided to call a Mass Convention, and fixed the time and place of meeting, Wednesday, August, 11, 1880, at 11 o'clock A. M., in the city of New York, for the purpose of organizing a National Dental Association, to be composed of every State society in the country.

A Constitution and all necessary regulations will be prepared by a sub-committee, and submitted for revision to a meeting of the full committees, to be held in the same city at 9 o'clock, A. M., on Monday, August 9, 1880, at Sturtevant House, so as to be thoroughly prepared for the action of the Mass Convention.

The importance of this measure requires that the whole time of the Convention shall be devoted to the business of organization.

All members of State societies and associations, and those intending to become members, are cordially invited to be present at this Mass Convention and to take part in its proceedings.

As this proposed National Association is intended to promote the best interests of the whole Profession of the country, it is important and is especially urged that every State in the Union be represented by as large a number of Dentists as possible.

It is hoped, therefore, that *every* Dentist in the country who can *possibly* go to New York at that time will be present.

The following Executive Committees have been appointed to act together and make all arrangements for this meeting, such as procuring a hall, hotel accommodations, reduction of railroad fares, etc.

By American Dental Convention. J. G. Ambler, New York, N. Y. Charles Merritt, New York, N. Y. H. Townsend, Philadelphia, Pa. J. H. Smith, New Haven, Conn. E. D. Fuller, Peekskill, N. Y. G. A. Mills, Brooklyn, N. Y.

By Southern Dental Association. W. H. Atkinson, New York, N. Y. S. J. Cobb, Nashville, Tenn. J. W. Selby, New York, N. Y.

By New York State Dental Society, to co-operate with other committees. O. E. Hill, Brooklyn, N. Y. L. S. Straw, Newburgh, N. Y.

J. Taft, *General Chairman.*
R. B. Winder, *Chairman Com. of A. D. C.*
R. Finley Hunt, *Chairman Com. So. Dental Ass'n.*
F. A. Levy, Orange, N. J., *Gen'l Sec'y.*

Pennsylvania State Dental Society.

The Annual Meeting will be held at Bellefonte, Pa., July 27, 1880. Tickets can be secured at excursion rates.

G. W. Klump, D. D. S.,
Cor. Secretary.

ARTICLE IV.

Bromide of Ethyl.

The properties and value of this new anæsthetic were quite extendedly discussed at a recent meeting of the Paris Surgical Society. Half a dozen gentlemen related their experience, which, on the whole, gave a qualified endorsement of the drug. The same characteristics, good and bad, which have already been noticed by American surgeons, were observed by the French. No fatal cases were reported however.

Mr. Verneuil was struck with the rapid and powerful action of the anæsthetic. One of his patients, a woman, to whom he gave it, was put to sleep almost in an instant. M. Berger was also impressed with its power; a rabbit put under a bell-glass, in which were placed ten grammes (ʒ iiss.) of bromide of ethyl, expired at once. He had never seen so rapid an action in the case of chloroform or ether. These illustrations may be remembered in connection with the general fact, asserted by Dr. Turnbull, that the danger of an anæsthetic is in proportion to its strength of action. We may state here also the fact that a death is reported to have recently occurred in the practice of Dr. Levis while using the bromide. We are not informed, however, that the anæsthetic was the direct or sole cause of the death.

The opinion was expressed, during the discussion referred to, that the bromide of ethyl did not easily produce complete muscular relaxation, and could not be used in operations where such a condition is essential. The opinions, as we have said, while not against its use, were by no means strongly in its favor. This refers to the ether when inhaled. As a local anæsthetic it was spoken of highly. It is the only anæsthetic of this kind which, owing to its non-inflammability, can be safely used in connection with the actual cautery; such was the opinion of M. Micaise. Evidence of its value in this direction has been given by American surgeons, and the point was referred to by Dr. Turnbull, at the recent meeting of the American Medical Association.

It seems that bromide of ethyl is rapidly finding its true place as an anæsthetic, and that place is not a very high one.—*Medical Record.*

ARTICLE V.

National Dental Association.

The Executive Committee of the National (late Southern) Dental Association; of the American Dental Association; and of the New York State Society, would respectfully announce to the Dentists of the United States that they hav made ample provision for the reception and entertainment of all Dentists, whether alone or with their families, who will visit New York at the time of the assembling of the Convention from August 9th to 14th. The following hotels are recommended as being favorably suited for the convenience of the Dentists: Sturtevant House, Broadway, near 28th Street; Coleman House, Broadway, near 29th Street; Continental Hotel, cor. Broadway and 20th Street; Rossmore Hotel, cor. Broadway and 42d Street; Grand Central Hotel, Broadway and 3d Street. The above Hotels will accommodate guests with rooms at the rate of $1 per night for each person, and $2.50 for room and board for each person. Parlors have been offered at Sturtevant House, Coleman House and at the Continental for the use of the Committees. On and after the morning of August 9th, a Committee will be in attendance at Sturtevant House for the purpose of giving visitors information on all points connected with the convention.

EXCURSION FARES.—The railroad excursion arrangements by the lines from the East, West and Northwest are so ample and the rates so low, that it is not necessary to make special arrangements.

From Southern points the excursion rates to New York and return will be as follows: Norfolk, Va., by steamer, $14; Charleston, S. C., by steamer, $25; Augusta, Ga., via. Charleston steamer, $30; Columbia S. C.,via. Charleston steamer, $30; Atlanta, Ga., via. Charleston Steamer, $40. 35, Macon, Ga., at the rate of 6c. per mile, one way, to Augusta, thence by Cahrlestown. Other railroad rates not yet arranged for will be reported through the Presidents of the several State societies.

There will be several excursions given by the Dentists of New York and vicinity, in which all visiting Dentists are invited te participate with their families, which will, no doubt add to the pleasure of the meeting.

(Signed,) F. A. LEVY,
General Secretary.

EDITORIAL, ETC.

Death of Dr. Robert Arthur.—The many personal friends, as well as the very great number who knew Dr. Robert Arthur by reputation, were pained to know of his death, which occurred in Baltimore, in June last, of gangrene of the foot, the result of embolism of an artery.

Probably no man in the Dental profession was so widely known by his works as Dr. Arthur, and certainly as a forcible, terse and elegant writer, he had no equal in Dental literature; probably no man was more misunderstood and consequently unappreciated. Modest and diffident even to shyness, he was correspondingly sensitive. Fertile in brain and industrious intellectually, his thoughts always reverted to schemes for the promotion of his chosen and beloved profession. If he formulated theories which would not fairly stand the test of time, or if he originated methods of operation which were not approved by the profession at large, yet those who knew him best—and only those who got close to the man's heart really knew him—felt, even while they might disagree with him, that Robert Arthur's whole soul was in these methods and theories. Not that he wished for position or praise or exaltation above his brethren, but for the elevation of his profession and the benefit of his kind. His heart was in his work most unselfishly and truly. He was probably one of the most unworldly and ideal men of his day,—a day when utilitarianism has its full sway, and when a man's brains are judged by his success financially,—and knew less of the world and its ways, of its practical business ways than almost any of the writer's acquaintance. Large hearted, pure hearted, simple minded, generous, Dr. Arthur found his ideas bandied about as coarsely as jests, his carefully wrought theories belittled by men utterly unable to grasp their extent, and his whole animus treated most ungenerously. If under these circumstances he became perhaps morbidly sensitive, it was not to be wondered at; and if he found that his want of ability to do that which mere handicraft, with mediocre brains, gave to others, and so came of late to isolate himself from his profession, it is not to be wondered at.

People thought him *exclusive*, and sneered. His was simply the *seclusion* of the diffident scholar, pushed on by the great thoughts within, and hindered by the lack of "want of sensibility." And these opposing forces made him what he appeared to many—a failure. An appearance only. For in this world men are judged not so much bv what is in them of good or noble or true, but by what they succeed in doing, the gaping crowd not comprehending that the apparent or even real failure of such a man as Robert Arthur is more of a success than many apparently greater successes; and that his noblest success was in keeping strictly before him his one unselfish motive—to leave his profession better than he found it. If, as it is understood, Dr. Arthur died poor, in spite of the eminent opportunity his talents afforded him to become rich. it will not lower him in the eyes of those who knew him best.

The writer can never forget how, as a student of dentistry, his occasional interviews with Dr. Arthur impressed him, and chiefly his earnestness was conspicuous. Whatever else those who failed to accept his peculiar teachings saw in him, they could not help seeing, that he himself thoroughly believed in them, and that not only his great mind was bent upon them but that his whole heart was in them as well. No one could hear him speak and doubt his earnest sincerity. Now that he is dead it will be seen how largely he left the impress of that mind and heart upon his profession. H.

We append a few extracts from letters received from contemporaries of Dr. Arthur. The first is from one who, as retiring as Dr. A., begs that his name shall not be used. He says:

I am extremely pained to learn of the death of Dr. Arthur, the eminent professional brother and high-toned gentleman.

It was through his advice that I entered upon my collegiate course, more than a quarter of a century past, in the old Philadelphia College of Dental Surgery, in which institution he was an able and honored professor.

He was always genial and kind, and one of the most modest gentlemen it was ever my good fortune to be acquainted with Though extremely diffident (even to a fault) in the delivery of his attractive lectures, they were so replete in profound thoughts and practical truths, clothed in plain yet choicest expressions, as to appeal at once to the mind and heart of every grateful student before him. As a lecturer he won the admiration of the entire class, and his uniform courtesy and gentleness marked him a general favourite.

When your kind note informed me of his death, I turned at once to his able valedictory address, delivered before our graduating class, Feb'y 28, 1855, and was much impressed with this passage: "My heart swells with gratitude to the Giver of all good, often and often, when I think of the happy circumstances in which a good Providence has placed us, whilst in so many parts of the world, hard, grinding oppression crushes freedom of action, and even freedom of thought." Also with its concluding words: "Always remember this, gentlemen,—it is a great truth, full of consoling power—there is a Providence which regards our eternal good more than our mere temporary comfort, ordering all our circumstances so as best to secure this end. And rest well assured, that if you perform your duties in your profession always under a high sense of what is right, it will lead you to a success higher and more desirable than can be reached in any other way. It will bring you peace of mind in all your relations, and when your career in your profession and in life draws to a close, no accusing ghosts will stand behind you; and you will look, without dismay, towards the more desirable future then opening before you. You will have completed another period of probation, and it will be well if at that commencement, you are prepared, as a just life will best prepare you, to enter upon a career that will never close."

His earthly career has closed—the eternal commencement has come, and the dear old Professor, we may confidently hope, has entered into that rest which remaineth to the people of God.

Dr. W. W. H. Thackston writes:

My Dear Doctor.—I have rarely been more shocked by any incident or casualty than by this unanticipated death of a very dear friend, Dr. Arthur, for such were the relations which for a quarter of a century and more have existed between Dr. Arthur and myself.

Entering the Profession together when it was in its transitive state from an "occult art" to a liberal department of general science, we necessarily almost drifted together as representatives of a "new departure," animated by a common cause, and encountering common difficulties and obstacles; working in concert and co-operation, a "fellow feeling" drew us together, and that feeling ripened into the warmest personal friendship and esteem—which "grew with our youth," and on my part, and I think on the part of my lamented friend, "strengthened with our declining years." Dr. Mackall, if he be living, and myself, are now the two oldest surviving graduates of a Dental College in the world. I received the third diploma conferred by the "old College," which was the first, and then the only one, of its kind in existence. Drs. Arthur and Mackall preceded me one year; I graduated at the head of my class the following commencement. My fellow graduates have long since passed away, and I begin to feel hoary and in some sense patriarchial. I am painfully admonished that I too am passing away. How much longer will a kind, a merciful and beneficent Providence permit me to "labor in the vineyard?" And how soon may some kind and perhaps too partial friend be lamenting my call to the "great beyond," as we now lament our loved and lost friend, and professional co-laborer?

Lawn Mowers.—As many of our profession enjoy the pleasures of country life during a portion of the year when business cares can be profitably laid aside, and the system invigorated by the healthful exercise of out door life, we call attention to Hill's Archimedean Lawn Mower as one of the best in the market. Having recently purchased one for ourselves, we have had an opportunity of personally testing the merits of this Lawn Mower and can confidently recommend it for the completeness of its work and its easy working qualities. Different sizes are furnished from 8 to 18 inches for hand machines and from 24 to 32 inches for pony and horse machines. This and another style known as the Charter Oak can be obtained at the manufactory, Colt's Armory, or from Agents everywhere. Address Hill's Archimedean Lawn Mower Co., Hartford, Conn.

OBITUARY.

Robert Arthur, M. D., D. D. S., one of the most widely known dental practitioners in this country, died in Baltimore City, June, 1880. Dr. Arthur was the oldest graduate of the Baltimore College of Dental Surgery, having been a member of the first class, that of 1840, which assembled at the organization of this the pioneer of Dental Schools. After graduating Dr. Arthur practiced his profession in Virginia and the District of Columbia, afterwards removing to Philadelphia, where he was elected to a Professorship in the Pennsylvania College of Dental Surgery, which he held for a number of years. About the year 1857 Dr Arthur returned to Baltimore, where he has been in continuous practice up to the time of his death, which occurred from an affection of the arteries of the legs. Dr. Arthur first became noted for his manner of working adhesive gold foils, and afterwards for his views and methods concerning the prevention and treatment of dental caries, several treatises on which he published, as well as works on other dental subjects. He was also noted for his inventions, such as the disk for separating teeth, etc. We have been promised an extended sketch of Dr. Arthur's life, which will appear in a future number of this Journal.

Thomas Bell, F. R. S., &c.—Mr. Thomas Bell, whose death we recorded last week, was the son of a surgeon in large practice for more than fifty years at Poole, in Dorsetshire. He was born on the 11th of October, 1792. He commenced his professional studies with his father. In 1813 he proceeded to London, and attended the practice of Guy's and St. Thomas's Hospitals in the time of Mr. Cline, Sir Astley Cooper, Mr. Travers, and other celebrated surgeons of that period. In 1815 he passed the College of Surgeons, and in 1817 began lecturing at Guy's Hospital on the Anatomy and Diseases of the Teeth. He was appointed at the same time Dental Surgeon to the Hospital.

He also gave lectures on Comparative Anatomy in the same school. Mr. Bell resided for many years in New Bond Street, City, and had a large and select practice as a dentist, and attained a very high position in the scientific world. In 1836 he was appointed Professor of Zoology in Kings College, London, when he ceased his Lectures on Comparative Anatomy at Guy's. He was elected a Fellow of the Royal Society in 1828, and in 1848 was chosen secretary of that body, and held the office till his election as President of the Linnæn Society, in 1853. Mr. Bell became an honorary fellow of the Royal College of Surgeons in 1844, and was formerly one of the Board of Examiners in Dental Surgery at the College. Besides numerous contributions to the Transactions and Proceedings of the Zoological and Linnæn Societies, he was the author of a work on the "Anatomy and Diseases of the Teeth," "History of British Quadrupeds," History of British Reptiles," Gilbert White's "Natural History of Selborne," published in 1876. He gave up practice some years back, and retired to the Wakes at Seeborne, Gilbert White's house, which he had purchased from the family of the naturalist, and where he died on the 13th of March, in the eighty-eighth year of his age.—*The Lancet*

MONTHLY SUMMARY.

A Nerve Stimulant.—There are two nerves, says Dr. Brunton, in the *Contemporary Review*, known as the "fifth pair," which are distributed to the skin of the head and to the mucous membrane of the eyes, nose, and mouth. These nerves are closely connected with the heart and vessels, and by stimulating their branches the circulation may be influenced, as in the case of fainting. It is a curious fact that people of all nations are accustomed, when in any difficulty, to stimulate one or another branch of the fifth nerve, and quicken their mental processes. Thus, some persons when puzzled, scratch their heads; others rub their foreheads; and others stroke or rub their beards, thus stimulating the occipital, frontal, or mental branches of these nerves. Many Germans when thinking have a habit of striking their fingers against their noses, and thus stimulating the nasal cutaneous branches, while in other countries some people stimulate the branches distributed to the mucous membrane of the nose by taking snuff.

The late Lord Derby, when translating Homer, was accusetomed to eat brandied cherries. One man will eat figs while composing a leading article; another will suck chocolate cremes; others will smoke cigarettes; and others sip brandy and water. By these means they stimulate the lingual and buccal branches of the fifth nerve, and thus reflexly excite their brains. Alcohol appears to excite the circulation through the brain reflexly from the mouth, and to stimulate the heart reflexly from the stomach, even before it is absorbed into the blood. Shortly after it has been swallowed, however, it is absorbed from the stomach, and passes with the blood to the heart, to the brain and to other parts of the nervous system, upon which it then begins to act directly. Under its influence the heart beats more quickly, the blood circulates more freely and thus the functional powers of the various organs in the body is increased so that the brain may think more rapidly, the muscles act more powerfully, and the stomach digest more easily. But with this exception, the effect of alcohol upon the nervous system may be described as one of progressive paralysis. The higher centres suffer first, and the judgement probably is the first quality to be imparied, and this becomes the more so as the effect of the alcohol progresses, although the other faculties of the mind may remain not only undiminished by the action of the alcohol on the brain, but greatly increased by the general excitement of the circulation. By and by, however, the other parts of the nervous system are successively weakened, the legs fail and the person falls insensible. It is evident, then, that only the first stages of the alcoholic action are at all beneficial, the lattter being as clearly injurious.—*Druggist's Circular.*

Use of Chloroform in Diseases of the Heart.—On this subject M. Vergely, of Bordeaux, (*La France Medicale,*) remarks that there is a difference of opinion, some asserting that chloroform is very useful, and others that it does harm in affections of the heart. In M. Vergely's memoir, to which M. Dieulafoy has recently drawn the attention of the Societe Medicale des Hospiteaux, three principle points are established.

1. That the existence of heart disease does not contraindicate the use of anæsthetics.

2. That chloroform is a sedative in this class of disease.

3. That it should be used with discretion. In some cases of severe palpitation chloroform may be successfully administered. Also in some cases of dyspnœa and palpitation arising from insufficiency, either alone or conjointly with hypodermic injections

of morphia. M. Vergely has also given it without any accident in angina pectoris, and in certain other affections of the heart characterized by dyspnœa and palpitation. From inquiries he has made into the literature of the subject, he concludes that this agent has been employed too timidly and unsystematically. —*Druggists Circular.*

The Setting of Plaster.—Why does plaster set is a question often asked. This was invested by Dandrin, who examined the chemical and physical changes that occurred during the process of solidification. With the aid of the microscope he observed that burned plaster, in contact with water, assumes a crystalline form; that the water surrounding the crystals takes up in solution considerable sulphate of lime, and that, a portion of this water being evaporated by the heat resulting from the chemical combination, a crystal is formed which determines the crystallization of the whole mass, just as when a crystal of sulphate of soda is dropped into a saturated solution of that salt. It is not, however, until after some time that the mass acquires its maximium hardness, the plaster then containing the required proportion of water, that is, two molecules to one of the sulphate of lime. This amount of water does not lessen by evaporation.

In mixing plaster, only about 12 per cent. of water should be added, as ordinary plaster itself contains about 8 per cent.; but in actual practice the amount used is never less than 33 per cent. This excess is added in order to prevent setting before it can be used. But the effect is injurious, since very porus, slowly drying plasters are produced in this way, which rapidly determine nitrification. To diminish the rapidity of setting is to delay the crystallization. This can be effected by adding gum, gelatine, glycerine, or similar bodies. Inert substances, like sand, for example, on the other hand, simply diminish the solubility of the material without in the least retarding the setting process.

Over-burned plasters may be utilized by mixing them with ordinary plaster, as the crystallization of the latter will extend to the former and occasion the setting of the entire mass. Lime acts favorably on plaster, as it not only increases the rapidity with which it sets, but it gives it additional hardness. Plasters to which 10 per cent. of lime has been added are capable of taking a polish.—*Chemical Gazette*

A Form of "Land Scurvy."—In the last (February) number of the New Orleans *Medical and Surgical Journal*, a correspondent in Louisiana describes an affection which strongly resembles what is known in Germany as "land scurvy." He states that the part disordered is the gums, which are of a dark red, have a tendency to bleed easily, cleave from the teeth, making them look unnaturally long; the breath is disagreeable and the patient does not seem to suffer much inconvenience from it, except at times when the disease seems to be particularly increased. The patients drink, smoke, chew tobacco, etc. and eat as others do. There is no unusual salivation. but when they bleed it seems to be from a surface, not from any crack or fissure. The parties are not of syphilitic character. It goes locally under the name of "scurvy," and is very difficult to cure. He says he has never cured a case yet, although he has tried acids, natural salts, astringents locally, together with iodide of potash internally.

We have seen such cases occasionally in the Northern States, but have found them to yield readily to chlorate of potash and citric acid, with a varied diet and improved sanitary surroundings.—*Med. and Surg. Reporter.*

A New Narcotic.—Jamaica dogwood, piscidia erythrina is recommended in the London Pharmaceutical Journal as powerful narcotic, capable of producing sleep and relieving pain in an extraordinary manner. It has been used as an anodyne in toothache, curing the pain when introduced upon a fossil of cotton into the carious tooth. In Brazil it has an established reputarion as nervous sedative. Its actions seem to be over the nerve-centres; it causes sleep without producing the cerebral hyperæmia which succeeds opium and morphia. The sleep is tranquil and refreshing; it soothes bronchial cough and moderates the paroxyism of asthma and nervous coughs. It has been used with ssuccess in chronic hepatitis and obstructions of the liver. —*The Druggist.*

Apparent Death as a Result of Asphyxia.—Medical journals occasionally inform us of wonderful resuscitations brought about by the persistent use of artificial respiration, but two, lately reported to the Academy of Sciences. Paris, by Dr. Fort, Professor of Anatomy in the Ecole Pratique, are especially noteworthy and teach us to persevere in any efforts we may make to bring signs of life. In the case of a child, three years old, who had already been placed in his shroud, Dr. Fort commenced the use of artificial respiration three and a half hours after apparent death. After four and a half hours steady work, the child was brought back to life. The other case was that of a drowned man, who had been under water twelve minutes before the body was recovered. Artificial respiration was commenced an hour afterwards, and after being kept up for hours, the man was restored to life. The report of the meeting of the Academy does not give the details of the child's case before the appearance of the apparent death, nor what prompted the doctor to commence the artificial respiration.—*L' Union Med.*

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ARTICLE I.

An Essay on Mechanical Dentistry.

BY W. W. FORD, DENTIST, MACON, GEORGIA, CHAIRMAN OF THE COMMITTEE ON MECHANICAL DENTISTRY.

(Read before the Georgia State Dental Society. Session of 1880.)

Professor Harris says: "Mechanical Dentistry means the art of constructing and applying artificial teeth, artificial palates, and appliances for the correction of irregularity in the arrangement of the natural teeth." I think Dr. Harris' definition of Mechanical Dentistry is too limited. Mechanical Dentistry, or dentistry that is strictly mechanical, forms a very important part of nearly every operation belonging to the dental profession; this is true also of the profession of general surgery. The extracting of a tooth is mechanical; the knowing how and when to do it is not. The making of a gold or other filling is mechanical; the knowing how and when to do it is not. The making and adjusting of a full or partial set of teeth is mechanical; the knowing how and when to do it is not. So in surgery, the setting and splinting of a broken limb is mechanical; the knowing when and how to do it is not; and even further, the amputating of a limb, the tying of an artery, is after all strictly mechanical; the knowledge of how and when to do it is not. Then I say away with your line of distinction drawn by the word mechanical between the different operations in our profession.

I am firmly of the opinion that operations that are strictly mechanical in our profession are a vast deal more important than many things we write and read and think more about. What does it benefit a dentist or his patrons for him to be thoroughly versed and highly educated in his head, if his hand is not correspondingly educated to put into practice what his head knows? I have known some highly educated dentists, so far as the theories of dentistry was concerned, that could not make a decent filling or perform any mechanical operation in dentistry in even a passable manner. I will, however, say no more on this line of thought, as I fear I am trespassing upon ground that I am not expected to occupy. I will therefore confine myself to that department which is generally considered legitimate—*Mechanical Dentistry.*

1 wish I could say something; I wish I could devise some means or construct some argument that could even assist in elevating the standard of this much abused and degraded part of our profession to that high standard where it properly belongs; I wish I could speak in such thundering tones that every dentist in this broad land and even in other lands, might hear me, that I might tell them the great importance of elevating the standard of mechanical dentistry to a higher standard of mechanical education, a higher standard of work, a higher knowledge, a more skillful and artistic application of the rule and laws of artificial dentistry.

But what shall I say to you, dentists of Georgia? What can I say? Will you let me beg you and pray you to stop and think, and look and gaze with me, gentlemen, at the present degraded condition of this useful, scientific and all important part of our honored, noble profession. Shades of the departed spirits of Bell, of Fox, Bourdet, Fouchard, Kœcker, Delabarre, of Harris, and Robinson, rise up from your mouldering clay, and stand up here to-day in all your immortal glory, and behold with us of the Georgia Association this magnificent ruin of all the faithful efforts that you spent so much time, toil and talent in constructing, building and beautifying.

"Tell it not in Gath, publish it not on the streets in Askalon," that even in this great and glorious Empire State, noted ever for her wealth, her education, her refinement, her intelligence, her liberality and patronage to the arts and sciences, even in the very heart of this State, sets of things, claiming to be sets of first-rate artificial teeth, are made and palmed off upon a credulous patient or patron, with any number of guarantees that they may ask for, for the mighty, the stupenduous sum of five or ten dollars a set, including the extracting of the natural teeth. What a magnificent fee even the latter is for a scientific, skillfully performed operation by an educated, high-toned, proud, professional gentleman.

What a liberal, philanthropic, public-spirited profession we are getting to be. Look at it, gentlemen, and think of a man giving his time and studying hard from three to five years, (for I hold no man can learn it in less, in or out of college,) paying for his own board and clothes, his tuition, buying his own text books, instruments and materials to learn a profession, and when he has done and paid all this, he sets up to practice, and gives away, yes, gives his patrons the entire benefit of all his toil, time and expense, "*free gratis for nothing.*" How grand, how generous, how magnanimous he is. Let his name be written and indelibly engraved in letters of living light athwart the ethereal blue, that it may last and rise up to the full duration and dignity of immorality. I am led to exclaim, in the beautiful language of Poeck, "may his lovely and beautiful shadow never grow less or refuse to follow him whithersoever he goeth."

I say, and take it for granted, that all his knowledge, all his skill, all his grand and magnificent talents and time are given away when he works at such a price, because my material, board and clothes, without putting in office rent, and taxes, and license, costs me fully that much to make a set of teeth that I would have the hardihood and audacity to put in my patient's mouth and tell him or her they were worth carrying home, or wearing out of my office.

> "Oh wad some power the giftie gie us,
> To see oursels as ithers see us."

Let us diagnose this case and see if we can find out the cause of this flood of cheap stuff that is scattered all over the country. I am of the opinion that it is in a great measure the result of poor, cheap material that has been thrown upon the market, together with the plastic materials used for plates, and also the want of mechanical skill. In the old and better styles of plate work, on gold and platina plates, no man could get off a piece of plate work and get the money for it unless he was able to do a fair job, because he could not make it stick in the mouth long enough to get it off his hands. It required more skill, more mechanical education, if you please, both of the head and hand, to make it do at all, and much more than these plastic materials do. With them, any man that can take an impression and make a plaster model—can, in a few hours, get up something that will, after wearing for a few days, answer for awhile. I knew one dentist who told his patient if the plate did not fit well, to soak it in a cup of hot coffee and put in the mouth while warm and press it up and it would be a l right. The great trouble about this work is, the people's natural teeth are being sacrificed by the wholesale to give place to these miserable abortions known as cheap sets of teeth, which is recommended as being better than the natural ones, because they will not ache. Oh how anxious everybody is to get rid of the tooth-ache once for all; how ready they are to believe anything in that direction and suffer anything else but that. Well, these teeth they get may never ache, but they make many hearts ache when they realize the loss of their natural teeth when it is too late.

When I first entered the profession, twenty-five years ago, things were not so. The cheap men of those days did not pull out teeth as they do now, because they could not put them back, consequently they would fill them with something, either gold, or tin foil, or common silver amalgam, or Hill's stopping, or something that did no harm, if it did no good. They at least left the teeth in the mouth so the person had another chance of having them saved by somebody that could do it. Now, it is easier to pull them out and put in a worthless something in their place than it is to even try to save them.

But we will not pursue this thought further. We will now give our views, in part, at least, as near as we can, of what we consider some of the requirements and duties of the mechanical dentist in his laboratory.

I hold, that no man can learn to be an accomplished mechanical dentist without, what I would term, a regular apprenticeship under a competent and accomplished preceptor in the laboratory. The principal trouble of the present day is, that we learn, or think we learn, it too soon. We do not spend the time and study absolutely necessary to learn even the fundamental principles of it, much less the art and training of the hand and eye so necessary to a fine execution of the work, and then we are too easily satisfied ourselves. If the patient does not complain it is all right with us, whether we may know ourselves that it is not, or whether we may know that it is, all the same with us. The amount of time required to obtain the knowledge and practice this part of our profession successfully, will of course vary with different men, owing entirely to their mechanical genius and aptness, and also to their former education in the arts and sciences. Some men are so quick to gather and put in practice any mechanical or scientific idea, that it does not take them long to become an expert in mechanism of any kind, while another may dig and dig for a lifetime and then be ordinary, or low middling; but a certain amount of knowledge and practical ability is absolutely necessary to success with all, and it takes some time for all to obtain this knowledge and ability, and not only time, but a competent preceptor or teacher, for if a man learns wrong it is much harder for him to get right than it is to start from the beginning. No man can just look at two or three good pieces of dental mechanism and learn from that, or see a few pieces made by another and learn from that. He must learn to do it himself, and do it himself unaided, because the first case he has may require something entirely different from anything he ever saw. The accomplished, successful mechanical dentist must be to all intents and purposes an artist; he must study the human face as well as the laws of nature there developed; when natural teeth are gone, as is often the case, before he ever sees the face, he must be able to look at that face and see and know exactly what that face has lost and what is needed to restore it to its orignal beauty, symmetry and regularity. The expert will not go to work and try to improve upon nature in perfection by making what some would call a beautiful, small, white, pearly set of teeth for a large, dark back ground. The true artist copies nature as closely as possible. If the scene selected is a rough, scraggy mountain, or a boiling, tempest-riven sea, in painting or transferring the scene to canvas, he sticks to the natural original as it is, and paints it as he sees it in his mind's eye. He would not paint a beautiful flower garden on a sandy, storm-beaten beach, or one on the scraggy, snow-capped summit of a high mountain. He will paint them on the lawn or the meadow, where the flowers usually grow. On the scraggy top of the highest mountain he will paint the beautiful snow. He will make things have their natural fitness and correct adaptation. Thus it is with the artistic dentist; he will study nature closely and diligently in all its different phases as depicted in the human face and copy after it, and not assume the prerogative of the "great Creator" by trying and claiming that he can improve upon it. In dentistry, true art is in concealing art, by imitating nature so closely and perfectly that the difference will not be discovered.

The next thing, he must thoroughly understand the nature and the composition of the material that he is working with. I know there are many men trying to work porcelain teeth, that are totally ignorant of what and how they are made; there are some who use rubber and vulcanize it, that know nothing of the composition of dental rubber (or caoutchouc) and cannot tell why it is that a certain amount of heat hardens it. A dentist told one of my patients this year, that he would not make or wear a rubber plate because the rubber had arsenic in it. I knew that all of the dental rubbers had the sulphuret of mercury known commonly as vermilion, in them as a coloring matter, but that was the first time I had heard of arsenic being in it. Now no man can be a success in medical dentistry unless he thoroughly understands all about what he is working with and upon, the whys and wherefores; it cannot be made a success in the dark. He must know all about what he is doing in every part of the entire process, and next what is not of the least importance, he must be a high graduate, fine, close seeing, tasty, skillful, ingenius, well trained mechanic. If the dental profession were all better mechanics than they are, both in the operating room and in the laboratory, we, and the world would be better off than we are now. I claim that it takes a high order of mechanical skill to produce a first rate piece of artificial dentistry, on any kind of a plate, whether it be gold, platinum, rubber or celluloid; whenever you look at the work, you can tell very quick, what sort of a mechanic the man was that made it, however more difficult one process may be than another, still you can detect in either, what manner of man has been at work on it.

A first class mechanical dentist is able to make a good job of work on any base that is now made or worn. No man is fully competent to practice this department of our profession who is only competent to make rubber or celluloid work. Every dentist that sincerely desires to excel and reach the highest point of excellence in this department, and cares for the prosperity and elevation of this part of the profession, should learn not only the mechanical, but also the ceramic department, so that he will know how to select the crude minerals and metals from nature's laboratory, and prepare and compound them and form them into those beautiful imitations of the natural organs we see displayed in porcelain teeth, then when he goes to select a set of teeth for his patient, it makes no difference with him who made them, he can readily tell whether or not they possess the requisite strength, the proper blending of colors in the enamels, the proper amount of translucency or not to sustain the proper shade in the mouth, and whether they have been fused enough or too much; this knowledge is almost indispensable with every intelligent dentist, and the only way I know for him to learn it thoroughly, is for him to learn how to make porcelain teeth himself from the crude minerals and metals as they are found in a natural state; this part of our profession, for I claim that it is a legitimate part of it, is by far the most beautiful, interesting, and scientific. I could never tire of those beautiful and careful operations and processes by which porcelain teeth are produced; the knowledge is worth the time and labor it takes to learn it as a matter of pleasure and information, if a man never had any use for it. But every dental mechanician has almost daily use for this knowledge; he should not be found without it.

Every mechanical dentist ought to thoroughly understand the nature and character of nearly all the different metals, particularly the royal metals. He should understand how to melt, weld, temper, refine, solder or alloy them to any degree of fineness, so he will know how to adapt them to his case that he may need them for, and how to make or alloy his solder, what grade of fineness to have it for the piece of plate or wire he wishes to unite by fusion, and what kind of flux to use for the different metals to make them work to the best advantage. In gold or continuous gum work on platina plate, he needs a good knowledge of moulding in sand, so as to transfer any plaster model that he may have to a correct duplicate in metal.

The next point I will call your attention to is, the mechanical dentist in all work and in all cases must be a master with the laboratory lathe and corrundum wheels. If working on gold, he must fit his tooth or teeth nicely down on the plate at every point, so it will bear equal at every point; he must make his joint square against the adjoining teeth, to fit as close inside as outside, and at the same time have the proper length and contour. In rubber or celluloid, if he is working gum teeth, (and no others are so good in nearly all cases for either of these bases,) he will, in order to keep the material of the plate out of his joints, which destroys the beautiful natural effect of a good porcelain gum, he will be exceedingly careful to make his joints fit very close on the inside as well as the outside, for if the rubber once starts into a joint it will go through and discolor it; one brother said to me, "I can't keep the rubber out of my joints any way I can fix it." I will tell you how to do it—in the first place, you must have a good, true, steady running lathe. I found Snowden & Cowman's United States lathe a first-rate machine. I like the short spindle best; I am now using S. S. White's laboratory lathe, No. 3, and I am very much pleased with it; those who wish to sit down to the lathe had better get No. 4. Place your lathe near a window or under a good sky-light, get a corrundum wheel that runs perfectly true on your lathe, (I use Johnson & Lund's, with a brass centre with threads cut in them,) see that the wheel is also true on the face; if you can't see a chigger's eye, get you a good pair of spectacles, hold your section or tooth square and steady against the face of the wheel, and then if you can't make a good joint you are a poor mechanic. If the face of your wheel is worn out, as I call it, full of ridges or furrows, you cannot make a close joint with it—cast it aside and get a new one. My friend and colleague, Dr. W. R. Holmes, told me he used a new wheel for every set of teeth he made. I have never found it necessary to use that many, but I discard a wheel just as soon as it gets so uneven on the face that I cannot grind my section perfectly true and square with it. Be careful not to grind away too much of the material before you try it to its place, then you can tell where it wants grinding off the most before your material is gone. The block or section should never be held to the wheel so it will cut from the inside towards the outside of the gum, because it will flake off or notch up the edge of the gum enamel, which is softer than the body, and will give you a rough, ugly joint just where you want it smooth and even; next, after making your joint as close as you can, and you find after removing your base plate, that your joint is the least bit open on the inside, fill it up with dry plaster, and wet it with liquid silex, that will keep the plate material from starting in it; if you find your joint is very open, better let the rubber go in and fill it up, as it is better filled up with rubber than left open to catch food and secretions of the mouth. I measure my rubber in a star rubber gauge, being careful to get as near as possible the exact amount needed; after packing, I bring my flasks together slowly in boiling water. I use an old oil celluloid boiler and press for that purpose. After it is brought entirely together, I take it out and put in my bolts. I think dry heat should never be used with rubber; it destroys all the vitality and life of it, and makes it weaker. I am careful not to have too much excess of rubber, if you do in many cases it will press the teeth back and open your joints and rubber them, however close you may have made them. I cut notches with a file on the bottom edge of the upper section of my flask and cut my gates to those notches, so if I get too much excess of rubber it will squeeze entirely out of the flask, and not spread between the sections of the flask and hold them apart or resist the pressure so stubbornly as to move the teeth before it will get away.

I will call your attention to another fact just here. If the teeth are tried in the mouth on the base plate after they are ground up and the saliva gets in the joints, they ought to be taken off the base plate and all the saliva washed off them thoroughly with warm water and the bicarbonate of soda; if they are cased up in the flask with saliva in the joints, when they are vulcanized (or soldered, if on gold,) the joints will turn perfectly black, however good otherwise they may be, and you cannot possibly get the black out and get them bright again; even nitric or hydrochloric acid or alcohol will have no effect upon them. On this point of good and bad joints I have tried to be a little explicit, even at the risk of being considered tedious, from the fact that I have seen more universal failure just here than any where else. Still I am saying nothing in this essay, I presume, that will be new to many of you, neither do I hope to do so, but it may be of interest to some to listen to the recital of these important truths.

REPAIRING RUBBER PLATES.

There is only one way to repair a rubber plate when it is cracked or broken entirely in two pieces that will make it good again, and that is to duplicate the plate, and make the rubber part of the job entirely new. This process was described by Dr. W. R. Holmes, in No. 2, of the *Dental Luminary*, some time ago. I will describe the way I do it as near as possible. Some ten or eleven years ago I had trouble with some plates that split or got broken. I tried the old way of boring holes through the plate and putting on a patch of new rubber. I found the new rubber did not unite with the old, neither did the crack in the old plate unite together—the only strength given to the job was the strength contained in the patch, and by vulcanizing the old plate over it was damaged and very much weakened. The thought occurred to me that I could cast a model and counter model of the old plate, and by the aid of heat pull out all the old rubber and then obtain a perfect duplicate without moving or loosing the teeth, or my articulation.

I succeeded so well, that now I never repair a broken plate any other way. If the plate is broken entirely in two, stick it together with liquid silex, then drop some melted wax on the crack on the lingual surface of the plate, then fill the bottom of your flask with soft plaster and after oiling the surface, fill the palatine surface of the plate and press it down upon the plaster in the flask until the plate is thoroughly full and comes over the edge up to the edge of the porcelain gum of the tooth. After trimming as in a new job, fill up the other section of the flask, after scraping away the wax you dropped on the crack in the old plate. When the plaster has thoroughly set, take the flask carefully apart; you will find the edges of the plate exposed so you can take hold of it with nippers or plyers, then put the section containing the teeth and plate in water and boil it strong for ten minutes, take it out and take hold of the edge of the old plate with nippers quickly and pull it all out. If hot enough it will pull out easy and perfectly. If you want the new plate thicker, scrape away the plaster of the counter-model containing the teeth, cut gates and proceed by packing, etc., as in a new job; after doing this a few times you will find you can do it nearly as quick and as easily as you can patch a job. You will then have a new plate that is obliged to fit if the old one did, for you have a perfect duplicate in every particular, with no old revulcanized burnt rubber to trouble you or your patient again.

The arrangement of the teeth on the plate is a part of the work that is done wrong as often, or more often than it is done right. I have noticed that a great many in grinding up and articulating a set of teeth just let them go any way they will without any reference to the shape or contour of the face whatever. The result is, we see sets of teeth that when the patient laughs you can see all of the fourteen teeth, and if there was a gold filling put in the posterior surface of the second molar, you could see that. Mouths treated that way when the person laughs, not only look like they had fourteen teeth, but they look as if they had at least forty; the whole face is teeth, you can't see anything but teeth. That is an unpardonable mistake. Don't let your teeth just go into any shape the alveolar border may incline them to go, but make them go as you want them and as the face requires they should go. If the face be narrow, make the teeth narrow, whether the gums are or not, and see that the cuspids nearly cover the bicuspids and the bicuspids cover the molars, and let them run in a straight line from the cuspids back, inclining a little out. If you have a broad face, make them square, or nearly so, in front, and wide between the cuspids and then run nearly straight back on a line behind the cuspids. In other words, from the angle or turn in your teeth on the cuspid teeth and don't make them in a perfect circle, or in the shape of a mule shoe, and never make pointed or scooter-shaped set of teeth for a broad, round face, if you do you will disguise your patient. Study and carefully observe the natural teeth in different shaped mouths and faces; you will see how they are arranged there and copy after them and you cannot materially err.

I would like to have said more on the subject of gold work, but time and your patience forbid. This paper is already extended to too great a length. The whole subject of mechanical dentistry is too much for one paper, or one committee; they cannot do the whole subject justice in the time allotted to them. It ought to be subdivided as the other parts of our profession are and given to more than one committee, but as there is so little gold work and continuous gum work being made in the bounds of our society, I thought if I left out any thing I had better leave out that. I think, and firmly believe, however, that the very best work that can be made, at anything like what is considered a reasonable price in this day and generation, is a good gold plate with sectional gum teeth (made for rubber work,) fastened on it with hard rubber. When well made, it is as strong as all gold work, and stronger than all rubber and as clean and nice as continuous gum work; it does away with all low grade solder that is liable to oxidize in the mouth; it is light and pleasant in the mouth; it can be repaired, if the teeth are broken, with more facility than any other kind of work. I have a piece of that kind of work I made ten years ago, and will show it to any one that may wish to see it. When made, as that is made, it does away with all the objections to either gold or rubber work. I think, however, that Dr. John Allen's continuous gum work, made as he makes it, is the best work ever made without any exception, but it is entirely too costly for the South.

I am not opposed to rubber or celluloid, *per se.* I think they are good in their place, but still I think they have done dentistry a great deal of harm, and have done the public a great deal of harm and a great deal of good. I do not use celluloid, because it never gave me satisfaction. I have never yet seen a piece of it that had been worn over a year but what it had absorbed the secretions of the mouth and became offensive, and had changed its color and in time it loses its strength and toughness and becomes hard and brittle. It may answer a valuable purpose for temporary teeth. Good rubber well and carefully vulcanized and worked with good gum teeth, makes a very good, cheap set of teeth. Two or three sets ought to last an ordinary lifetime, and will cost less at a good price for it than one set on gold or continuous gum work, but like every kind of work, it requires to be well made. A few words more and I am done.

Mechanical dentistry is not receiving the attention of the profession at large that its merits and importance demands. Many of our (so-called) scientific men are disposed to throw it off and discard it. It is not written about in our journals, and talked about in our associations and conventions as much as it ought to be; men that cannot make a first rate set of teeth even on a rubber base, would rather hear themselves gas on the microscopy of a leaf or a fly's foot, or talk about cutting one eighth of an inch off the bottom end of the pulps of a tooth and saving it alive permanently, than to write and talk about mechanical dentistry, because these terribly scientific gentlemen are afraid they will be classed as mechanical men, when the truth is, if their true mechanical ability was known to the world they would not be in the least danger of being classed among good mechanics. I am not opposed however, to a proper study of the microscope or the conservative treatment of the dental pulp, but let us first learn how to do in the best manner possible all the legitimate and every day operations of our profession, then we will have time to study those subjects more thoroughly. Prof. Charles Essig said one dental student wanted to matriculate in the dental department of the University of Pennsylvania, just to learn operative dentistry; he just wanted to learn how to ply teeth; he did not wish to know or learn any thing about what he called mechanical dentistry; of course he was not admitted on those terms, and never could be, where as fine a mechanical dentist as Prof. Charles Essig is, was at the helm. Whenever you see a man turning up his nose at this department, and sending off his plates to somebody else to make, you may just set it down as dead certain, that he cannot make a good job to save his life. First class men in this line, are not willing to trust their work in any one's hands but their own, especially in the hands of some one who never saw their patient's face or mouth. They will take special pleasure and delight in doing it themselves. In conclusion, we will say there is not a word in this paper that is meant or intended to be personal to any dentist in Georgia. Now let us one an all, dentists of Georgia, strive harder than we have ever done before in every job that we make, not only in the laboratory, but also in the operating room. To reach the highest point of excellence, let us place upon our banners the grand old motto of Homer: "*Strive for the Best,*" until we all get as near perfection as it is possible for mortal, finite man to reach.—*Dental Luminary.*

ARTICLE II.

More About Riggs Disease.

BY GEORGE A. MILLS, BROOKLYN, N. Y.

(Read before the Con. Valley Association, June 17, 1880.)

Mr. President and Gentlemen:—I deem it not unprofitable to present to you particularly, what I have prepared regarding a subject that I may say truly, that you have been the instrument of bringing into somewhat an extended notice to our profession, while the part you have taken in this matter has aroused not a little antagonism, arising from a variety of motives which are common among men, and have at times disturbed some, who thought perhaps their particular modes and practices impregnable; and all we can ask of them "who have always done it" is to join with the progressive movement that has been put into action and rejoice in the good that may accrue from the results of this beneficial practice, which brings so much relief to impaired physical conditions prevalent among those we are called upon to serve. You are aware of the part I have taken in this controversy. I have abundant testimony that I have not stated anything that was not true and is not now fully proved beyond controversy to the understanding of any who seek the *unbiased* truth. When I published my five articles in Cosmos, titled: "What I know about Riggs Disease," I did better than I thought. For the first time in the meeting of the American Dental Association, the following August at Chicago, the subject gained the attention of our profession by an extended discussion, which you will find published in their proceedings, numbering some twenty-seven pages, and on my reading them I was confirmed in thought, that it only needed fair and dispassionate attention to impress all true men, that it required and demanded an earnest investigation in the interest of our clientage. Some eighteen months later at a meeting of the Brooklyn Dental Society the subject of popular education was discussed and the necessity was indicated, that it needed to be done, to make it useful, in a more efficient manner. A remark was dropped that what the public needed was truth on points that were essential to their interest. The impression came to me then, that I had in those articles something which was to their interest to know, and coupled with the thought, it occurred to me that a larger dissemination of the same would not do any harm among the profession. The result of this was the publication of my little brochure under the title "A Series of articles on the so-called Riggs-Disease," "loosened teeth" or Pyonhora Alveolaris; [pus discharging sockets of teeth] which some of you have seen. Taking the view of this movement that I did, I was not at all troubled about being disturbed. I commenced their distribution not only among some of my patients as opportunity offered, but I mailed a copy to several members of the profession with whom I had personal acquaintance and soon much to my gratification [but quite unexpected] I received commendatory letters regarding them, and also a pleasant notice was given in the Dental Register by Professor Taft, saying no doubt I would gladly on the receipt of postage send one to any desiring them. Suffice it to say a continued distribution has been made up to this time numbering some seven hundred among the profession throughout this and foreign countries, and it has been the means of bringing me into correspondence with many, affording both pleasure and profit. I was also much gratified to find Dr. Riggs was pleased to endorse what I had written and that he has since given a free distribution of the articles among his patients and this has also been done by dentists. The amount of discussion growing out of the agitation of this subject has not been small among our associations and has also taken on no little interest among those of other countries; we have testimony of these facts on the pages of our several journals. This subject is still worthy of the attention of a greater number of our profession, than those having yet given it, for it is far from becoming an actual daily practice with many and those who talk about it even, giving an impression which does not accord with the condition of the mouths of some of their patients. I could detail a good many specimen cases; there are those who talk much to their patients, but utterly fail in practice; I will give you an instance. My attention was called to a case that had been under treatment some six months. I found all the teeth discharging pus. A superior central incisor was quite a good deal elongated and by occlusion of the teeth, it was made to play in and out, keeping up a continuous state of unrest which of course would be but a matter of time how long it could remain in its socket, certainly without removing the mechanical interference by grinding so that it could be brought into its proper position and fastened by ligatures or otherwise. It has been my observation that such a failure of understanding of these cases is not an isolated one, and my calling attention to the fact may of itself be suggestive to the ingenuity of any that should wish to make a greater effort than they had hopes of doing with success. There are many cases of this kind presenting themselves to the practitioner with not only one tooth disturbed by improper occlusion, but often several. The ligatures, elastics, silk, wire, disks, and the new cast Gold Alloy are valuable auxiliaries for the control of such conditions. I shall refer, further on, to this matter and introduce to your notice an advance line of practice giving additional success to the treatment of loosened teeth in a greater degree than has ever before been secured. This diseased condition of the surroundings of the teeth has called considerable attention to the causes, and opinions have been given by different ones and still they are thought to be somewhat obscure, and I trust what I may say on this point, may not wholly fail to contribute something helpful.

Physiology is the building of tissues. Pathology the unbuilding. That we may be able to comprehend something of the service committed to our hands it will be of value to take into consideration the etiology of the subject we purpose to consider; first we are asked what is the cause of this destructive disease? (Riggs Disease.) I answer, debility. Some say the collapsing of the margin of the pericementum, causing it to drop back from its surrounding of the hard tissue, the neck of the tooth; others, that the deposition of lime carried by the saliva forming a crustlike collection and this acting as an irritant, setting up inflammatory action. I have given my answer that debility is the general cause and I may add very properly that it is "in esse" (in being) and local in manifestation. We have the fact before us, that, if the margin of the pericementum has commenced to disintegrate inflammatory action has already commenced its work; we also have the same evidence of debility by the deposits of lime; from one class of ducts we have an acid secretion; another, alkaline; this gives the saliva to the oval cavity in equilibrium; anything that may come in as a disturbing element to the nutritive action of the general system will cause the unbalancing of this satisfied solution and produce a precipitative action, indicating an abnormal condition. What are the working powers of tissue building into organizations such as ours? I answer, the *sensory*, and *motory* nerves; every influence favorable or adverse to these will cause a decided deflection by bringing about a state of exaltation or depression; this latter is exhibited in a marked degree in different parts of the human system, where the morphology (type or form) is seen to be deficient; as an illustration of this we see in the teeth with their impoverishment or want of calcification, a decided deficiency in the cusps and other parts, also expressed by a change in the saliva caused by a fright or anger, also, by exultation in joy, the sight or smell of food. Now it is readily seen that the nervous system is exposed in a multitude of ways from without and within, and with our present surroundings we cannot hope to escape entirely from their effects. This disturbance at the margin of the pericementum is undoubtedly originated by lack of circulation through the capillaries. When the diastolic and systolic action is enfeebled by continued disturbance, this forcing power falls short of its intended work. In other words, when the tonicity of the nerve force is deficient, we see debility; this produces a decrease of rension and is readily seen in its effects on the action of inspiration and aspiration of the lungs, by shortening the lengths of the breathings, by short breath, less oxygen is carried into the circulation, and stimulation of the blood current is lessened and the parts that require given amount of power to force the circulation to them, suffer by this enfeebled condition and they are from a want of sufficient nourishment reduced back to their embryonal condition. At this stage we find the work of reparation brought into requisition. The different degrees of this destructive disease are quite familiar to many. At this point let me suggest to every earnest dentist that he become familiar by *repeated readings* with the very exhaustive articles prepared by Dr. Bodecker, an honest and earnest investigator in the laboratory of Dr. Carl Heitzman of New York City. These papers are too valuable to be passed by lightly; they contain a condensed amount of instruction that should arouse the gratitude of *every dental student*, and I think the best way it could be manifested to the author, would be by showing a familiarity with his teachings. One particular point I will call attention to in these papers, viz: the finding of abscesses in connection with the inflammation of the pericementum and not associated wiih a dead pulp. This is comparatively a new presentation of this matter; I have in a number of cases come in contact with them and have been spoken to about them by other practitioners, and you have doubtless noticed reference to the fact by others in our journals of late. These conditions are complications of the disease which we are considering and need be borne in mind together with the treatment looking to a successful issue. Regarding the methods that have been presented in the treatment of this disease, I have nothing more to say about them than I have said, but I purpose at this point, to direct your attention to an additional line of treatment which brings to the aid of the practitioner a degree of helpfulness that has not before been attained and secures to the patient a success and amount of personal comfort that is truly gratifying; the cases are frequent when the teeth are deprived of part or parts of the socket supports and also by the loss of teeth adjoining them, and thus depriving these of their lateral supports, changing the occlusion by a general pushing out of line. You are familiar with such a state of things. If you will consider (for the moment) the value of an unbroken arch (on general principles) you will discover the importance of a lost tooth. How many are the cases that exhibit this disturbed and irregular condition? Is the effects of misapplied mechanical force by the changed occlusion, muscular tension and absorption of the soft and hard tissues, all these are disabilities and additional enhancements of the difficulties connected with the disease under consideration. While much can be done for the general improvement of the health and personal comfort of the patient by the before prescribed methods, we are now able to bring the teeth out of line and arch into their proper position, by ligatures, elastics and wires to remove mechanical interference from elongation and then by supplying the deficient lost tooth, combined with the cast new base (Gold Alloy) all together making such a combination of framework, giving a support to these loosened teeth, enabling the patient to put their previous *useless masticators* into comfortable use, from the instant, and giving an additional assurance that nature will be better able to supply the lost tissue surrounding the teeth by the state of rest secured with these auxiliaries. I am now speaking of the results gained by actual practice and observation both in Dr. Atkinson's and my own office; to Dr. Atkinson I am indebted for this advanced step. Now I am conscious that the question has already arisen, "What are you able to secure in the application of the new base more than by any other we have been using?" First, a greater degree of compatibility to the tissues (doubtless) in a comparative sense than from any other known material. Second more adaptation to the form of the plato resting on the soft tissues and the surroundings of those parts of the teeth requiring the support of the plates laterally and otherwise. A patient securing the intelligent treatment of the destructive disease, (Riggs Disease,) inflammation of the pericementum, or what other name you may choose to apply to it, all supply of deficiencies of the hard tissues by fillings, the appliance combining the lost teeth and its mechanical support, gives a complete, useful and healthful oval cavity into their possession under such a sense of appreciation of the value it possesses, gained by the earnest spirit of labor manifested by him who has performed it, as to permit of no future departure to the lower level from which they have been brought; and more, it sends out into their circle of association an educator, with a degree of potency, that will excelerate an upward tendency and do more to prove the value of dentistry in a much higher degree than has ever before been attained.—*Independent Practitioner.*

ARTICLE III.

The Electro-Chemical Theory.

BY S. B. PALMER, D. D. S.

If we can judge from discussions upon the electro-chemical theory as reported in the journals, and by the letters of inquiry upon the same subject, there is much need of knowledge of the principles involved, the object in view, and application of these principles in daily practice. The space at our command limits this article to a mere digest of the subject.

We claim no more for the doctrines inculcated than science supports; we expect no concessions from opponents that science does not demand. The writer is responsible for the enunciation that failure in operations is mainly due to incompatibility of filling materials with tooth bone. We deem it best to consider but a single principle in this short article, namely: the cause of incompatibility of fillings, and will take for illustration, gold and gutta percha, which are the two extremes. We venture to say, the latter is most compatible with teeth bone under the following conditions: In cases of leaky fillings, and in teeth so frail as to admit moisture to the filling through the tooth alone.

The theory is based upon the universal law that contact, say of copper and zinc, in a battery gives passage to a galvanic current—increased chemical action at the expense or loss of the zinc. Every tooth filled with metal is a miniature battery subject to the same fundamental law. All the variations, from preservation to destruction ot teeth by filling, are modifications or change of conditions. The results are the outcome of circumstances elected by the operator in the adaptation of filling material to tooth bone. Moisture is an element of secondary decay or decay around fillings. This is admitted by all opponents to the theory, yet it is said that "failure in operations is mainly due to defective manipulation." Why do defects produce decay? Simply because gold is incompatible with tooth bone in the presence of moisture. The perfect filling deprives the battery of the fluid element and checks the current as in any other battery. The fact that perfect fillings of this material preserve teeth is proof of our position. Imperfection likewise is proof of incompatibility.

Moisture is an element in all teeth, yet all teeth do not decay; neither do any decay from within. Decay around fillings is the result of moisture decomposed. Decomposition is a process of chemical action. Ordinary decay is a manifestation of such action. Galvanism, which is modified electricity, is always present with chemical action. The galvanic current is a powerful agent of decomposition. Now let us consult nature's text-book, the galvanic battery, for facts. We find that when two metals are plunged into a liquid which is a conductor of electricity, and of a nature to act upon one or both of the metals unequally, they will be found to be in different electrical condition—the one positive and the other negative. There is no current produced till contact is made between the two elements, then the current is established and continues as long as chemical action and contact remain.

There has been no little dispute upon the question as to which precedes the other—chemical action or the current. A little reflection would save time in this direction. Each is a part of a circle. The two elements, when separated, are in a state of static electricity. Contact equalizes the potential and but for chemical action they would be equally electrified. But chemical action, which is induced by the current, maintains the inequality and thus the current continues. We now transfer the workings of this law to the oral cavity and we find it to obey as correctly as that of gravitation in its manifestations upon a poor fitting atmospheric plate.

Decomposed fluid we have already stated in the cause of incompatibility of filling material with tooth bone. Continued decomposition is maintained by circulation. If a filling of any material in general use is perfect at the margins and the tooth is of proper density, there is no chemical action, no current, no decay back of the filling. This action, however, is at *first* set up with amalgam, and usually with tin, in all teeth filled with these materials, but for lack of circulation—more moisture to be decomposed, the effects of the effort remain an insoluable compound, compatible with both filling material and dentine. Lest the remarks respecting amalgam may not be understood it should be known that amalgam contains at least two elements of a battery, the alloy and the mercury. The two are not chemically combined like the melting together of gold and silver. The presence of a fluid like oral secretions furnishes the third element of a battery, and sets up slight action with amalgam, as can be clearly demonstrated.

The dentinal walls of any tooth are sufficiently damp to corrode the surface of amalgam in contact therewith. Thus we look in vain for brightness in amalgam in contact with dentine. This has nothing to do with the durability of the filling or preservation of the teeth. One advantage which might be claimed for the tarnished lining is that it reduces conductivity of the filling, and in case of frail dentine, or in the teeth of children where calification is incomplete, the metalic compound is received into the animal or organic substance of the teeth, thereby raising it to the same potential as the filling which cuts off chemical action, just as would happen in the deposition of copper upon the zinc element of a battery. With gold there would be, under the same conditions, no tarnish to lessen conductivity—nothing to restore the tooth, which is the positive element, to the same potential with the gold. On the other hand, any admission of moisture between the gold and dentine is equivalent to decomposition of the fluid and the tooth, according to conditions to be mentioned hereafter.

With gutta percha, or any other non-conducting material, the moisture accessable to the filling and walls of the cavity remains unchanged so far as a current is concerned. There would be none of the increased sensitiveness common to like exposure with gold; the conditions remain the same as would be apparent in like exposures where there are no fillings. One of the hindrances to the reception of truth in relation to chemical laws consists in the unwarranted statement that the tendency of the electro-chemical theory is to degrade the profession, also to discourage the use of gold. We do not attempt to meet any such inconsiderate charges, but rely upon the principle that truth cannot injure a just cause. The writer advocates the use of gold to the extent of its usefulness.

We do not claim that a practice conducted upon a scientific basis would essentially differ from one based upon practical experience; truth is a unit no matter how obtained; and practical knowledge is gained only by years of observation—years of failure as well as success. I believe that the result of every operation is determined by positive law, the conditions of which are present at the commencement: that each law acts within its own prescribed sphere; that it is the dentist's privilege, with a knowledge of natural laws, to so select material and arrange the conditions that success may be among things possible. Without this knowledge the young operator is left to go on in the belief that "failure in operation is mainly due to defective manipulation," and perform operations perhaps in direct violation of law itself. We need more investigation for principles upon which to establish practice, and less effort to maintain practice regardless of principle.

In the hope to convince the reader that the laws which we have already set forth are as much in the interest of a gold practice as they are in the other extreme, we quote from the writings of Dr. Geo. Watt, of Ohio, who is well known to the profession as an earnest advocate of gold, and as strongly opposed to amalgam. His practical knowledge of chemistry enables him to comprehend the subject of oral electricity, while his truthfulness to science prompts him to record his views regardless of their application to this or that practice. In returning to the subject of decomposition of fluids under fillings, Dr. Watt says:

"Saliva has a strong affinity for oxygen, and absorbs it readily from the atmosphere; that it corrodes many of the metals: that it is an electrolyte; and that acidity is generally a result of its decomposition." Again "When a gold plug leaks, there is apt to be galvanic action. The organic matter of the dentine is a conductor, and in this case repre sents the corroded or zinc side of the battery. Hydrochloric acid decay occurs in such cases, when the buccal fluids are normal, but when ammonia is present, we may have white decay co-operative with it, owing to the formation of nitric acid by electrolysis of the ammonia."

There can be nothing plainer than this statement—it is only a transfer from the laboratory to the oral cavity. It involves no new principle; it does not interfere with practice new or old, except as the operator may be governed by scientific diagnosis to adapt filling materials to the conditions which warrant success. We grant that long practice may furnish the same knowledge; but it is not professional nor progressive to insist that all knowledge shall be acquired by the experimental method and at the needless expense of the patient.—*Odontographic Journal.*

ARTICLE IV.

Treatment of Teeth with Dead Pulps and Alveolar Abscess.

BY DR. C. R. E. KOCH, OF CHICAGO.

Having at a very late day been asked to prepare a paper to be read before this society, and having very foolishly, though relucantly, consented to do so, to help the executive committee out of a scrape, I will endeavor in liquidation of that promise, to give you something which may serve as a starting point for discussion. My time and attention has been so much occupied of late with matters of various kinds, that it was impossible for me to prepare an essay.

If there are those among us who doubt that our profession has progressed in knowledge within the last twenty or twenty-five years. let them pause and compare the treatment of these cases referred to in the title of this paper, now, with that generally in vogue at that time. Then, an essay upon this theme might have been very briefly in two words, *extract them*, and would have met with the endorsement of the large body of the profession.

If now these cases are restored to usefulness, a great benefit is conferred upon humanity, and to do this with the least amount of suffering to the patient should be the aim of conservative practice.

It is true that failures in these cases sometimes occur to perplex and annoy us. Now and then a case may not progress just as we may wish or expect. In spite of precautions taken, our patient may call sometimes with an eye all but closed by a very much enlarged and rubicund cheek, and accompanied by a temper akin to that of a Sioux on the war path, exhibited in accents neither mild nor polite. Let us not be discouraged by such cases, but be all the more earnest in determining to know just what has caused this result and be careful to avoid a *faux pas* of the same nature, if it may seem that the untoward condition was the result of mistake or neglect of ours. Sometimes such a result may occur, however, from causes far beyond our reach or recognition.

We may say it as a maxim, that all teeth with dead pulps in them, irrespective of the cause which destroyed their vitality, and regardless of whether they have produced annoyance, pain, periostitis or abscess, and whether decayed or not, should be treated; always provided that we have unmistakable evidence that the pulps are dead.

We might lay down the following general rules for the treatment of these cases:

First.—Cleanse the tooth and free the gum around it *from all irritating substances.*

Second.—Open the pulp-chamber, allowing any gases that may arise from decomposition to escape, and cleanse it and the root canals as thoroughly as possible.

The opening into the pulp chambers should always be made at a point where it will least weaken the tooth structure, that will give the most direct and free access to the introduction of the broach, medicaments and light, and that shall, when again filled up, least disfigure the tooth.

The practice of drilling holes into teeth that give indications of the presence of a dead pulp at right angles to their longitudinal axes and leaving these open, it is to be regretted is not yet obsolete. It is only rational treatment in part, and renders a permanent cure absolutely impossible.

True it permits the escape of gases arising from the decomposition and prevents their accumulation within the confined space, and consequent pressure upon and inflamation of the surrounding tissue, but it renders utterly impracticable the removal of the dead organic matter which, if done, would prevent the generation of these mephitic gases and hence preclude the necessity for an escapement flue, which latter must always be a nasty catch basin, in which are collected the tooth-destroying elements.

Third.—Do not plug up the canals tightly until you feel sure that there is no longer any danger from the formation of mephitic gases, and the pressure produced by their confinement within the walls of the canals.

The opening having been effected and the broken down tissue removed as thoroughly as possible, the walls should be thoroughly disinfected. Creosote, carbolic acid, or proof alcohol, will be all sufficient. If there has been pain, or soreness of the tooth, iodine should be freely exhibited in combination with the disinfectant, but unless an abscess has already been formed great care must be taken to introduce these remedies gently and without force. If introduced upon a broach with cotton, this should not be wound so tightly as to form a piston in the root canal.

Sometimes, indeed, it may be necessary in the treatment of these cases, in which there seems to be an indolent, sluggish periostitis which does not yield to the resolvent iodine treatment, to bring about an acute abscess, and there is no quicker way to produce it than to plug up the roots tightly.

The roots having been thoroughly disinfected, the tooth is given a trial, a little loose cotton being left in to prevent the ingress of other substances. It is rarely safe to seal up a tooth of this kind at the first sitting, and especially in cases where pulps have been dead for a long time, without giving patients any uneasiness; great care must be observed to avoid irritation of this nature. After a probationary period of a few days the cavity may be sealed up and the tooth again put upon probation.

Fourth.—Being satisfied that the root is ready to receive the filling, it should be filled with an indestructible material, which is sure to be carried to the apex of the root, and leave no open or air spaces along the walls.

The tooth having stood the test of being tightly sealed up for three or four days, or more, without any untoward signs, we may proceed to fill the root.

Most any substance employed for filling teeth is good enough in straight and regular shaped root canals, but in flat or compressed roots with tortuous canals, where it is at times impossible to know just what the broach has effected, there is nothing more adequate than gutta percha dissolved in chloroform. This should be pumped into the canals, after which a brief time should be allowed for the separation of a portion of the chloroform, which may be hastened by blowing a warm blast from the air syringe into the cavity. A piece of warmed gutta percha should then be crowded into the cavity until the root canal is filled. Another probationary period should then intervene before permanently filling the cavity over this. It is believed that this material will come nearer to being a perfect root filling than any other in these cases, because it can be carried with reasonable expectation of success to every part of the canals, and if any particles of the pulp should have escaped removal by reason of inaccessibility, it would be rendered impotent for mischief by reason of its becoming encased by the gutta percha solution. Of course in cases where there is an enlargement of the foramen it would not be a suitable filling.

Fifth.—Never fill a tooth permanently until a sufficient length of time has elapsed since filling the root, to leave a reasonable chance for expecting no evil results from the operation.

Sixth.—Have the patient to understand that the treatment of these cases of teeth with dead pulps in them are not simple, and that while there is no probability there is still a possibility of an abscess and suffering before the tooth shall be restored to usefulness.

In this consideration of the subject of dead pulps we do not consider pulps destroyed by ourselves as a necessary act, as in these cases there is generally no treatment necessary after the extraction of the pulp and before filling the root, although it is well even in such cases to defer the completion of the operation to another sitting.

Where the dead pulp has been allowed to go on in its mischief until periostitis has resulted in acute abscess, the pus should be carefully discharged through the opening in the tooth, and sufficient time should be allowed to have every particle drained off. When satisfied that no more is forming, which sometimes may take a week or more, creosote or carbolic acid and iodine should be forced into the canals so as to pass into and bathe the walls of the abscess, after which the case should be treated with the same caution already spoken of.

When abscess has become of long standing, and has established a fistulous opening upon the soft fissures through the alveolus, it is generally very easily cured. In such cases, after removal of debris from the root or roots, these should at once be injected with creosote and iodine, or carbolic acid, and if a free flowing of the medicine can be effected through the root and fistula, one application is generally sufficient, and the tooth may then be filled without much more treatment.

Occasionally we meet cases of this kind that, however, seem obstinate and do not yield to treatment readily, owing to the difficulty of forcing the remedies through the canals as in anterior roots of some lower, and buccal roots of upper molars. In such cases the medicine should be introduced through the fistula by means of an abscess syringe and the sulcus broken up. Generally the cases will yield to the remedies mentioned, but sometimes the aromatic sulphuric acid may be employed to good advantage.

Cases which do not yield to the treatment described occur sometimes, owing to the roughened and irritating condition of the apex of the root, which from long-continued bathing in the vicious secretions has become eroded; such cases call for surgical treatment, and may be met by trephining through the alveolar plate and excising the affected portion; or, by extracting the tooth, excising the end of root involved, polishing and replanting the tooth. These operations will not often be consented to by patients, and are only warranted in extreme cases.—*Trans. Illinois State Dental Society.*

ARTICLE V.

The Ethics of Dentistry.

BY JOHN H. COYLE, D. D. S., THOMASVILLE, GA.

(*Read before the Georgia State Dental Society, Session of* 1880.)

> "The increase and multiplication of virtues among men resteth chiefly upon societies, well ordained and disciplined."
>
> LORD BACON.

The science of Ethics should constitute as much a part of professional education as any other science essential to his proper equipment for the successful practice of that profession. This is emphatically true, when applied to the profession of dentistry, for there is no profession in which a high toned moral code is more imperative.

There is certainly no profession which offers more temptations to swerve from the path of strict integrity; so many questions of duty to others daily arising, while self-interest is at war with honest conviction. Hence it happens that the young men entering the profession have the need of that moral courage, which is only attained by those of riper years and experience. If we will but keep in mind the golden rule we can never go very far out of the right path. To do this, however, requires a firm, unflinching adherence under all circumstances to ***high moral principle.*** This will illumine the darkest path we may be called upon to tread, and chase away the darkest clouds of uncertainty. This principle has been likened unto the spear of the Guardian Angel of Paradise:

"No falsehood can endure
Touch of celestial temper, but turns,
Of force to its own likeness."

It would be easy to declaim at great length, in a general way, and erect an ideal standard of Ethics, and leave each individual to make the application in special cases. It is a difficult thing, however, for the majority of men, in practice, to determine the precise extent to which principle is involved, and just how far duty and interest come in conflict.

These questions have to be met and decided, by none more frequently than the members of our profession. The responsibility, professional and moral, of the practitioners of dentistry, grow out of their duties, first to the people, second to the medical profession, and third to each other, and it is in this order that I propose to treat the subject.

We should never lose sight of the fact that it is *necessity* that places a single patient in our care. No person would undergo the tedious and oftentimes painful operations of the dentist, unless it was an *unavoidable necessity.* We should therefore use all means at our command to make our operations as bearable as possible. The public have a right to demand that we shall furnish a comfortable chair and the best instruments that can be obtained, together with the purest and best materials known and attainable for them. They pay for our services, and have a right to our very best skill and most faithful performance of what we undertake for them. As far as their knowledge of dentistry goes, they are like unto children, and are altogether in our hands. They have to rely upon our honesty and upon our judgment, and when they seek our advice the truth and nothing but the truth should be given under all circumstances. It is most frequently the case that the patient is more than willing to be "gulled," and it is only a question of moral firmness with the dentist. If he is not governed by high moral principle, he will undertake operations at the urgent request of the parties themselves, which he *must* know cannot result in any benefit, except the pecuniary one to himself. This may be a temporary advantage, but sooner or later will injure the dentist who pursues such a course, as well as bring reproach on an honorable profession. We should cultivate an amiable condescension toward all. It is not to be presumed that our patients are very far advanced in the special pathology of the teeth, as is abundantly shown by their questions, and we should patiently endeavor to give them a plain reason in plain English language for our course. How often do people apply for the filling of a tooth, which is found, on examination, to be devitalized with a discharge from it, the fœtor of which is so disgusting and almost unbearable, and when we tell them that it will not do to fill that tooth in that condition, what a stare of incredulity on their faces! And when we explain to them the condition of that tooth, and show them that it is absolutely essential to give it a preliminary treatment before it can be filled, how surprised they are, saying they thought that "a tooth never ached after the nerve was dead." How easy it is to take advantage of such a patient! But the man who would do it, who claims to be a dentist, you all know is either a *fool or a knave.* The public have a right, also, to expect that a dentist shall have an ordinary English education, and a fair acquaintance with the current literature of the day. In this country, I mean the Southland, only the better class of people apply for dental operations. They are, as a rule, people of cultivation and refinement, and how acceptable it must be to them to find that their dentist is a man after their own order, not only a skillful Dr. Forceps, but an agreeable and accomplished gentleman besides. John Ruskin says that "there is rough work to be done, and rough men must do it; there is gentle work to be done, and *gentlemen* must do it." I believe that this applies with emphatic force to dentists.

Our duties to the medical profession are of a less complicated character; though if one attached a great deal of importance to what has been said in this connection during the last few years, he would feel otherwise. To my mind there can be no possible clash of interests, except an apparent pecuniary one, and that does not merit a serious consideration. The dentist is confined both by his attainments and his license to certain circumscribed bounds of practice, and he is not sound in Ethics who desires to overstep these limits without the necessary qualifications and license of law so to do. This limitation of practice is embraced in any and all operations on the teeth and associate parts. In order that the general practitioner and the public may yield to him this practice to the exclusion of the M. D., he must demonstrate his qualifications to more fully meet the requirements of this practice. There will then be no longer any competition for it on the part of the medical men, from the simple fact that the public will voluntarily give it to the skillful specialists—the qualified dentist. We should remember that the medical practitioner is entitled to our profound respect and earnest co-operation. He has to deal with the hydra-headed monster, disease, in all its manifestations, as it crops out and shows itself throughout the entire system. Our knowledge of the special pathology of the mouth alone, should teach us the Herculean task he has before him. On the other hand, we have a right to demand of the medical practitioner a recognition of the superior attainments and advantages of the qualified dentist, for the treatment of dental lesions, and under this view it is a selfish spirit alone that would tempt them to interfere in our special practice. I come now to the last division of the subject: the duty of dentists to their professional brethren. And just here in the beginning let me say that there is a greater disregard of all principles of Ethics here than in either of the preceding sections. It is this brutal ignoring the commonest principles of decency and morals by a large number of dentists, so-called, that has often caused our cheeks to burn with a blush of shame, that we too, being dentists, would be classed with such men. Until a very recent date, the greatest accomplishment of the majority of those engaged in the practice of dentistry in this State, was a *full capacity for running down* other dentists. And there are dentists in Georgia in this day who tell their patients that "they are the only dentists in the Southland who could do that job that way." Dentists of this turn of mind doubt even the possibility of Shakespeare's lines, that

> "There are more things in heaven and earth, Horatio,
> Than are *dreamt* of in your philosophy."

What a calamity to ourselves, as well as those who come into our hands, to get into a "rut" of this kind. We should look around us and recognize the fact that this is an age of *unceasing* activity. The printing press, with its teeming millions of adjuncts, is spreading the truth and the light to millions besides our "one self," and just as the sun, in all his glorious effulgence, is to be seen by other eyes, so are the sources of professional information and professional attainments open to all. The greatest evidence that can be given of a total want of the apprehension of the first principles of dental ethics is this expression of absolute professional egotism, big *I* and *little* you. The time was when the pioneers of Dental education came forth to battle with the hosts of ignorant quacks and self-dubbed doctors, that a moderate boast of superior attainments might have been allowable; but, gentlemen, that time is past, and my heart's desire and prayer to God is that it may never return, but rather that the ethics of the profession may become deeply implanted in the hearts and minds of every dentist in this land.

Gentlemen, the opening words of this paper declare that the "increase and multiplication of virtues among men resteth chiefly upon societies well ordained and disciplined." I believe this to be a profound *truth*, and in view of the great moral responsibility resting on this body for the advancement of virtues among its members, it behooves you to *look well to your discipline.* This is the rock of your strength in your efforts for the future. Your published code of ethics is all that can be desired, provided it is sustained by a rigid enforcement of its provisions on your individual members. A strict enforcement of this code, without fear or favor, will result in honor to yourselves, the advancement of our profession, and confer a lasting benefit on the people of this State. In the very first Article of our Constitution, Section 2, we declare that one of the purposes we have in view is the elevation of the character of dentists. We have only to look at the results of our past efforts to encourage us for the future conflict. In the brief space of eleven years we have attracted to our body the majority of the respectable dentists of the State, who have signified their determination to yield obedience to our system of Ethics. Through our influence Dentistry, which hitherto had no legal status, has been brought into intimate relationship with law and ethics. The people have begun to recognize the truth as it is—that your work is as much for their interests as it is for our own. Rise, then, to the high plane of your duty; insist upon a strict interpretation and a strict enforcement of our code of Ethics, and I promise you that you will meet with a hearty response from the people. Of course there are hundreds of "Cheap Johns," "Bush Whackers," "Quacks and Pretenders," all embraced under the head of Ruskin's "fee first men," who will cry you down, and represent you as a "red tape body," but fear not. The truth is mighty, and *must* prevail, for

"Truth, crushed to earth, shall rise again,
The eternal years of God are hers;
But error, wounded, writhes with pain
And dies among her worshippers."

—*Dental Luminary.*

ARTICLE VI.

Washing Amalgams.

BY THOS. FLETCHER.

I have so frequently been told by operators of their great success with washed amalgams as compared with unwashed, that I have been at some pains and trouble to discover the reason of what may be granted as a fact. Knowing with certainty that the process of washing was a serious evil, the fact of practice being directly contrary to theory, puzzled me not a little until I watched a good operator at work washing an amalgam, when the explanation of the anomaly was simple enough. It would appear that all who have compared washed and unwashed amalgams have treated both in the same way, *i. e.*, by mixing with excess of mercury and squeezing out. Knowing that without exception all plastic fillings are liable to total failure unless they set rapidly and thus preventing alteration of form by moisture, and knowing also that amalgams mixed with excess of mercury are exceedingly slow in setting, the advantage of washing was explained in the simplest manner by the longer time required to manipulate the mass, which resulted in the filling being harder than when finished than if no time had been lost by the washing process.

As the mixing with excess of mercury had been utterly condemned both by theory and practice, this apparent advantage in favor of washing is at last proved to be a false one.

Any amalgam to be absolutely reliable must be worked in such a manner that it is hard enough for mastication as soon as finished, or at least in a few minutes after. Granting this as a necessity for good work, the process by which it is obtained and which requires the smallest quantity of mercury is the best.—*Dental Advertiser.*

Virginia State Dental Association.

The regular annual meeting of the Virginia State Dental Association will be held in the city of Richmond, Tuesday, December 14th, 1880, at 10 o'clock A. M.

It is hoped that every member of the Association will use his best endeavors to be present, and lend his aid in making the meeting interesting and profitable.

All members of the profession, not only in Virginia, but in sister States, whether members of the Society or not, are cordially invited to meet with us and take part in our discussions.

As there was not a quorum present at the last meeting of the Association, the President has decided to retain the same committees. The members of the committees are respectfully requested to give strict attention to the extract from the Constitution.

Members and visitors to the Association will call at the office of the Corresponding Secretary upon arrival for information as to place of meeting.

Fraternally yours,
L. M. Cowardin,
Corresponding Secretary.

American Academy of Dental Science.

The thirteenth annual meeting of the American Academy of Dental Science, will be held in Boston, on Wednesday, October 27th, at 10 o'clock A. M.

The annual address will be delivered at 2 o'clock P. M. by Dr. Joshua Tucker of Boston. Dr. Tucker's world-wide reputation and large experience cannot fail to make the occasion both interesting and instructive. Members of the profession are cordially invited to attend.

O. P. Wilson,
Corresponding Secretary.

EDITORIAL, ETC.

False Teeth.—At the meeting of the National Dental Association held in New York City during the present month, Dr. Patrick, president, made a speech on the subject of the business of dentistry, its growth and importance, which cannot fail to have a depressing effect upon those who speculate on the infirmities of poor human nature. There are, he said, 12,000 dentists in the United States—that is to say, one to every 3,000 men, women and children in the country—and these dentists must make a living by drawing, inspecting, repairing and supplementing our defective teeth. They annually pack into our unsound teeth not less than half a ton of pure gold, worth $500,000, besides four times as much cheaper material—silver and platinum—worth $100,000 more. Conceive the American people going around with two tons and a-half of metal in their mouths! It was also a fact, said Dr. Patrick, that three million false teeth were made and planted in our mouths every year. Think of it! The present population of the country between the ages when the second teeth have grown and that when teeth cease to be an object is less than 54,000,000, requiring, in a full dentition, which scarcely any have, 768,000,000 teeth. Allowing an average of 20 teeth to the head we have 480,000,000 teeth. The average duration of a false tooth may be put at ten years, so that there must be now in this country not less than 30,000,000 false teeth—one in every sixteen. This is independent of the patched and repaired teeth, and the numerous "snags" which are not worth looking after. The worst of it is that Dr. Patrick thinks our teeth tend to grow worse instead of better. The rule of the "survival of the fittest" does not work in this case. The perfect set of (false) teeth in this generation does not become the perfect set of natural teeth in the next. On the contrary, Dr. Patrick has no hesitation in saying "that the next generation will witness a greater abnormality in dental development than we have yet seen. It is for this simple reason that there is a greater tendency to nervous and cerebral diseases resulting from fast living and injudicious food. The Doctor advises the dentists to rise to a higher plane to meet the coming disease.

MONTHLY SUMMARY.

Recent Dental Conventions.—The activity among the dentists has been unusually great during the past few weeks. The American Dental Association held an annual meeting at Boston, August 4th, 5th, and 6th; the American Dental Convention and the Southern Dental Association met in this city, August 10th to 14th. These two latter associations united to form a National Association under the name of the Dental Association of the United States. This association is expected to be the representative body of the American dentists. It will hold annual meetings in different cities, and quadrennial meetings in Washington, where its permanent secretary is to reside. The Association aims at high scientific work, and will arrange at once to secure governmental recognition to the dental profession, and help from it in studying ethnological peculiarities in their relation to dentistry. The Smithsonian Institution promises aid in this direction.

A vote was passed making it a requisite for membership that the applicant should have credentials from a State society, or the diploma of a reputable dental college. This latter regulation, it is expected, will give an impulse to dental education.

The new association was not formed without some opposition. The American Dental Association has tried to have a national character, and it refused to allow its organization to be absorbed in any other. But its work and membership, if we may believe the reports, have been of a too local character. It was therefore decided to form an entirely new society. Any genuinely scientific work done by the dentists will be of value to the medical profession. If this new association, therefore, secures, as it promises, the performance of such work, its creation will be a matter of congratulation for us.

We have examined the reports of the various meetings above referred to, and confess to being greatly disappointed in our hopes of finding any good scientific work performed. In the American Dental Association there were papers devoted to the relative merits of cohesive and non-cohesive gold, the respective values of which, it seems, ought to have been settled long ago; the use of belladonna to lessen the flow of saliva, catarrh in its relations to dentistry, and the evil effects of the various patent amalgams, were some of the topics presented. We noticed a paper on Anæsthesia, which was defined to be a "paralyzation of the nervous tissue." In a subsequent discussion on the subject, the question as to whether nitrous oxide oxidized the blood, or prevented its oxidization was discussed. The fact was brought out very strongly that the Association did not know anything about the matter whatever. A practical movement was made in the appointment of a committee to arrange for an International Dental Congress. Considerable time was devoted by the American Dental Association to the discussion of dental education. Of course the question whether dentistry was a branch of medical science was fully debated. We quote and commend the remarks of Dr. Barrett on this point: "We dentists," he said, "should be honest. We are not medical men, and are not acknowledged as such by physicians. There is no way by which a student can become a member of the medical profession, except through a medical college." The Association urged that the dental colleges require a higher preliminary medical education and two courses of instructions.

We find even less evidence of work at the New York conventions than at that held in Boston. The daily papers perhaps gave undue prominence to certain parliamentary infelicities, but these were certainly much too frequent for the credit of the societies.

Most of the time was given to excursions and the business of organizing the association. An interesting paper was read before the Southern Dental Association, on Mercurial Poisoning Caused by Sucking the Amalgam of a Mirror. Not much else of general scientific value, however, was presented.

It will probably strike any one who reads the reports of the dental conventions to which we have been referring, that American dentists are persons sadly deficient, as yet, in scientific as well as in parliamentary knowledge. Their meetings have, however, shown a commendable appreciation of deficiencies and desire for progress. And considerable work was done which will eventually secure scientific and educational advancement in dentistry.—*Medical Record.*

Influence of Tobacco Smoking Upon Health.—In the *Revue d' Hygiene* for November, 15th, 1879, Dr. Decaisne observes that the excessive use of tobacco causes in some subjects intermission of the beats of the heart and radial artery. Out of eighty-eight smokers who came under his observation during a period of three years, he found twenty one cases of intermittent pulse, without any organic lesion of the heart. He states—

1st.—That none of the subjects who came under his observation had organic disease of the heart.

2d.—That none of them were in a state of health favorable to the development of intermittence in the beats of the heart.

3d.—That in nine cases the complete abstention from smoking tobacco was sufficient to restore the cardiac rhythm and the system to their normal condition.

He therefore says that the abuse of tobacco produces in some subjects a condition which he terms *nicotism* of the heart. which is manifested by intermissions in the beats of that organ, and in the pulsation of the radial artery. It is sufficient in some cases to suppress or diminish the use of tobacco in order to stop or diminish the irregularity in the heart's action.

Dr. Delaunay, in commenting upon Dr. Decaisne's paper in the *Revue d' Hygiene* for January 15th, 1880, calls attention to the influence of the emanations from tobacco upon pregnancy. In a poor district of Paris there is a manufactory of tobacco in which 2000 women are employed. According to the evidence of a midwife who has attended a great number of women employed in this factory during their confinements, they are peculiarly liable to miscarriages, which they attribute to the influence of the exhalations from the tobacco. Some of the women, who are not altogether dependent upon their earnings from the factory, leave it when they become pregnant until after their confinement. One woman who had twice miscarried while working at the factory, left it when she was in the fifth month of her third pregnancy. Her child was born alive at the proper time, but died soon after its birth. The mother did not return to the tobacco factory, and her fourth pregnancy terminated in the birth of a healthy child, who survived. During her first three pregnancies she suffered much from obstinate vomiting—due, perhaps, to the action of the tobacco.

From these and similiar data Dr. Delaunay deduces the following conclusions:—

1st.—Tobacco has a pernicious influence upon the health of children and mothers.

2d.—It impairs the health of pregnant women, and causes miscarriage.

3d.—It has the same noxious effect upon children weak from their birth.

4th.—It diminishes the quantity of milk and alters its quality for the worse, and, consequently, prevents the proper growth of the child, who, indeed, often dies, a victim to his mother's occupation.—*Medical and Surgical Reporter.*

Anæsthesia in Dentistry.—The New Jersey State Dental Association, at its recent meeting passed a resolution to the effect that its members should avoid the use of anæsthetics as much as possible, and that in every case requiring anæsthesia the greatest care should be taken to insure the safety of the patient by a preliminary examination into his physical condition. Under ordinary circumstances the precautions advised would be considered altogether unneccessary; but, coming from a body of dentists, and with the formal sanction of a deliberate society vote, they have more than an ordinary significance.

It need not be stated that dentists, as a class, are addicted to the free use of anæsthesia; neither is it necessary to assert that a large proportion of fatal cases, especially with chloroform, have been associated with dental operations. Hence, it appears peculiarly appropriate for a society of dentists to give the matter such serious attention as is indicated by the resolution to which we have referred.

The injunction to abstain from the use of anæsthetics whenever such a thing is possible will not have, practically, much force with dentists. The desire of a patient to avoid pain, and the inclination of the operator to oblige him, are two powerful elements which will always argue in favor of anæsthesia. Besides, the public are educated to the belief that for tooth-extraction pain is not necessary. The administration of some sort of anæsthetic is now considered to be a necessary condition of the operation, and the dentists who fail to meet the want are in danger of losing custom. It can hardly be expected that any dental operator, under such circumstances, will strain a point to persuade a patient not to be rendered insensible to pain; but, if the other part of the resolution is conscientiously carried out, viz., the preliminary examination into the physical condition of the patient, many fatal accidents may be prevented. —*Medical Record.*

Compressed Mother-of-Pearl.—M. Duvochel has invented a compressed kind of nacre or pearl made of the pulverized shell of the Halotis, solidified with gelatine. Thus prepared it will serve for inlaying or mounting in cabinet work, cartonnage, tabletture, and other industries, and the manufacture of fans, buttons, etc. This product can be figured, stamped, moulded by pressure, poured out in the liquid state, and, in fact, take all forms. It can be dyed in any color, polished and varnished by the processes used for tortoise shell, mother-of-pearl, and other analogous substances. To render the shells thin and friable, they are submitted to a strong heat, which separates them into thin scales; these are then pressed in the cylinders of a flattening roller, and afterwards pounded in a mortar. It is then sifted to get rid of the dust, and the powder is treated with gelatine, and shaped into any form required.—*Am. Jour. Indust.*

Ready Way to Test Chloroform.—The purity of chloroform for anæsthetic purposes being very important, the following simple tests are recommended by Dr. J. Regnauld: If chloroform be dropped upon paper and allowed to evaporate, the last portion, on being inhaled, has a characteristic pleasant smell, and leaves the paper perfectly dry. Impure chloroform has a disagreeable, irritating odor, which it imparts to the paper. Pure chloroform does not redden blue litmus, or give even a cloudiness with silver nitrate; but if the sample should do either, it contains hydro-chloric acid or the products of the decomposition of some other chlorides Pure chloroform remains perfectly colorless when boiled with potash; the presence of aldehyde causes a brown coloration. When chloroform is shaken with concentrated sulphuric acid and allowed to stand for half an hour, the two liquids should separate into two colorless layers; the presence of alcoholic chlorides produces a brown coloration. The purity of chloroform may be judged by its constant boiling point, 60 8° Centigrade; the impure sample may boil above or below, according to the impurities it contains. The assigned specific gravity affords no certain test. Hoffmann's violet will dissolve completely in pure chloroform, but if there is a trace of alcohol the solution is of a beautiful purple color.—*Druggists Circular.*

The Tasting Power of the Tongue.—The tasting power of the tongue is not regularly distributed over all parts of that organ. According to the unanimous judgment of physiologists, the back part of the tongue is best qualified for this function, while there is a difference of opinion as to the tip of the tongue. The old observers have repeatedly said that a tasting power in the tip is limited to certain persons, whereas more recent ones affirm its presence in all men. In experimenting on the so-called "reaction time," Harr Vintschgau lately met with a case of limited tasting power in the tongue-tip, and this led him to a thorough investigation of the subject. The observations were made with solutions of chloride of sodium, sugar, quinine, and citric acid. The results were as follows: There are persons who are capable of accurately distinguishing all principal tastes with the tip of the tongue alone; others perceive with certainty the qualities of sweetness, saltness, and acidity, but less distinctly bitterness; others again can only with great difficulty distinguish tastes with the tip of the tongue; and finally there are individuals who cannot do this in the least.—*Druggists Circular.*

A New Anæsthetic.—The French journals contain an account of the successful employment of Prof. Bert's new anæsthetic, which consists of nitrous oxide 85 parts, and oxygen 15 parts, under tension. Prof. Labbe, the distinguished surgeon of Lariboisiere, having occasion to remove an ingrowing toe-nail, carried his patient to the "Aerotherapic Establishment" of Dr. Dauplev, and administered the anæsthetic in a chamber, the atmosphere of which had been compressed to 92 centimetres. After the lapse of a few seconds the patient became perfectly insensible. and the operation was performed and the dressing completed without the slightest manifestation of pain at the time or the development of any unusual symptom afterwards. Under ordinary conditions this mixture produces no effect upon the economy. while its employment under tension results in the speedy development of an anæsthesia which is profound enough to render surgical operations painless, and of so innocent a character as to preclude the possibility of a dangerous complication.—*Dr. Edward Warren(Bey,) in N. Car. Med. Jour.*

Remedy in Muguet. (*Thrush.*)—Dr. Vivier observes, in *Progres Med.*, March 27, 1880, that by far the best application in this disease—that of Bazin—has almost fallen into oblivion, which he attributes to the fadt that Bazin never published a formula. After numerous trials Dr. Vivier recommends the following, which constitutes a mode of treatment incomparably superior to any other: Distilled water, 25 grams; alcohol, 5 grams; and corrosive sublimate 60 centigrams. The patches of muguet are to be swept over by means of a pencil moistened in this, once, twice, or three times a day, according to the rapidity of the reproduction of the cryptogam. In spite of the poisonous character of the agent its application is made without danger and always with rapid success, unless the patches are inaccessible by being placed in the phraynx or at the back of the velum. The application has only one inconvenience—that it must be made by the practitioner himself; but the rapidity of the cure amply compensates for this.—*Med. and Surg. Rep.*

The Action of Collodion on Temperature.—We learn from the *Bull. Generale de Therap.*, June 15th, 1880, that Dr. Raducan has made some interesting observations on the effect produced on the general temperature by the external application of collodion; these he publishes in his inaugural thesis (*These de Paris*, 1879.) In health the effect on the central temperature varies with the site of the application. If the collodion be spread on either of the lower limbs the temperature is unaffected. But if the collodion be applied in such a way as to cover all the cutaneous surface corresponding either to the peritoneum or the pleuræ, an immediate and notable lowering of the central temperature is observed. Dr. Raducan thinks that the difference noted explains the therapeutic action of collodion in inflammation.—*Medical and Surgical Reporter.*

Safety of Hydrobromic Ether.—The new anæsthetic has not yet defined its comparative safety and merits. Its action appears to be more nearly allied to that of chloroform than of sulphuric ether. In the *Cincinnati Lancet* is reported a case happening in Philadelphia under the charge of Dr. Tevis, the subject being a stout, muscular man who inhaled four drachms and then after violent struggling yielded to its influence and suddenly ceased to breathe. Artificial respiration was at once resorted to, the body inverted, and several drops of nitrite of amyl placed at his nostrils. Recovery took place though it is evident that he had a narrow escape. In a large proportion of cases the action of bromide of ethyl is described as more free from unpleasant results than either chloroform or ether. In a few cases only have sickness or other bad results ensued, and when sickness has occurred it has passed off sooner than the sickness of ether.—*Pacific Med and Surg. Jour.*

Death from Bromide of Ethyl.—Dr. R. J. Levis, of Philadelphia, the distinguished advocate of Bromide of Ethyl, recently lost a patient under this anæsthetic at the Jefferson Medical College Hospital, Philadelphia. The patient was about to be operated upon for stone in the bladder, but died as the first incision was being made. Dr. Levis was present during the administration of the anæsthetic, and no doubt exercised every known precaution. This case speaks a painful warning, and sounds the death knell to this over praised agent.

Perfect security against death from anæsthesia is not possible. We believe when prejudice has ceased and calm, judicial testimony is offered that chloroform will yet regain professional confidence, and receive recognition as the most reliable and satisfactory of all anæsthetics up to this time employed.—*Maryland Medical Journal.*

American Dental Association.—At the session of the American Dental Association, held in Boston, the report on Section 2, on dental education, urged that the Association should fix a standard of preliminary education to be required by dental colleges. The question whether dentistry was a specialty of medical science or not was considered. Dr. Brophy urged the necessity of dentists having a thorough medical education and a complete knowledge of dental surgery. The Association voted to hold its next annual meeting in New York City.

Dental Instruments Transmitting Syphilis.—A middle-aged lady called on us for the treatment of several ulcers on the tongue and palate, and for severe pains extending from the mouth down the neck to the body. She said that a dentist had plugged a tooth with an instrument containing blood, which had just been drawn from the mouth of a youth. The woman had syphilis, was treated for it, and recovered. It is unquestionable that the dental instrument had been the medium of innoculating the body with syphilitic virus. How many innocent persons, including even little children, may be victims of dental carelessness and filth.—*Journal of Materia Medica.*

Local Anæsthesia with Bromide of Ethyl.—M. Terrilon stated, before the Paris Surgical Society, that he had employed the bromide of ethyl about a dozen times in operations with the thermo-cautery. In a minute or two a white patch indicating cutaneous anæsthesia is produced, and on the pulverization being continued insensibility of the tissues is produced to the depth of two centimetres. The production of the white patch is not essential, as anæsthesia may exist when it is absent. The results have proved very satisfactory, but in two cases M. Terrillon did not succeed, owing, as he believes, to the pulverizators which he employed having too small a jet.—*Druggists Circular.*

Changes in the Maxillary Bones in Ataxics.—M. Vallin has observed, in several cases of locomotor ataxia, a falling out of the teeth which is not preceded by pain or caries. This phenomenon is due to a bony rarefaction of the alveolar border, as a result of which the teeth simply drop out of the alveoli. It is a trophic alteration of the maxillæ which has not hitherto been described, but which deserves careful study, as it may be an early symptom of the general disease. MM. Luys and Lereboullet have also observed this falling out of the teeth in ataxia. —*Le Courrier Medical.*

Local Anæsthesia by Bromide of Ethyl.—M. Perier, of Paris, states that he has employed the bromide of ethyl several times as a local anæsthetic with considerable success. It has the advantage over ether of not being inflammable, and hence can be employed when the actual cautery is to be used.—*La France Medicale.*

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ARTICLE I.

Anæsthesia by Ethyl Bromide.

BY H. AUGUSTUS WILSON, M. D.,

Opthalmic and Aural Surgeon to St. Mary's Hospital, and Surgeon in
charge of the Surgical Out-patient Department; Lecturer on
Microscopic Anatomy and on Fracture Dressings
at the Philadelphia School of Anatomy.

I desire to present in this paper a summary of facts known, up to this date, in regard to the anæsthetic use of the ethyl bromide.

During last winter I received a dissection wound, which required laying open; my confidence in the ethyl bromide was such that without the slighest hesitancy I consented to pass under its influence.

Dr. Levis poured one drachm upon a folded napkin, and I with my right hand applied it closely to my face. In one minute Dr. Levis asked if I was ready. I could barely understand what was said, but could not reply, and fearing that the knife would be applied, I managed to utter a groan. A second drachm was applied, and in half a minute more the incision was made, without cognizance on my part, and the napkin removed. One half minute more, or two minutes from the time of commencing to take the anæsthesia I sat up, recognized and called by name a person who had entered the office during my unconscious moments. No nausea or other distressing symptoms arose. My efforts at first were directed to watching the influence it would have upon me, but that influence was exerted so rapidly and stealthily, that ere I was aware of it I was in that happy condition which is such a boon to those about to undergo surgical procedures. Thus my apology is made, if apology is necessary, for presenting this subject again to the profession; my object being to incorporate, if possible, the views expressed in some of the recent articles upon the ethyl bromide and its uses.

The ethyl bromide, which was discovered by Serullas, in 1827, received but little attention until Nunneley, of Leeds, England, called the attention of the profession to it, in 1849. It was not long, however, before he was compelled to abandon it, because of its costliness. Rabutau, of Paris, again evoked interest in the subject, in 1876, in connection wite some experiment on animals.

In 1878 Dr. Laurence Turnbull, of Philadelphia, read a paper before the Pennsylvania State Medical Society, urging the advantages of this article as an anæsthesia.

The matter was looked upon passively until Dr. R. J. Levis, of Philadelphia, took hold of the subject actively, in April 1870, and gave it a trial during his term of service at the Pennsylvania Hospital, and later at the Jefferson College Hospital.

In January, 1880, he published his first article upon the subject. It was not known until after the publication of this article that any experiments on man had previously been made abroad with this agent, and the cautious manner in which each administration was watched showed a desire to understand the *modus operandi* of its application.

That the ethyl bromide occupies its present high standpoint credit is due, first, to Dr. Turnbull, for reviving the attention of the profession to it; and secondly, to Dr. Lewis, who, with his large hospital opportunities and extended experience with anæsthetics, gave the drug a most careful investigation.

Thus, starting from Philadelphia, its application spread to all parts of the country, and recently word has come to us, through the journals, that it has been successfully introduced into Canada and France.

During the past few months a medical journal could hardly be found which did not allude to ethyl bromide, showing conclusively that the profession, tired of the dangerous chloroform, inconvenienced with the slow, nauseating ether, was ready and anxious to accept an article which promised as much as this new candidate for popular favor. Having watched the growth of the use of this anæsthetic from the time it was first used in the Pennsylvania Hospital, frequently administering it for Dr. Levis, in private surgical practice, more frequently, perhaps, carefully noting the effects when administered by Dr. J. B. Roberts, I have continued to use it in preference to any other anæsthetic, at St. Mary's Hospital in this city, and in my private practice.

ITS CHEMISTRY.

Heretofore ethyl bromide has been made by using potassic bromide, but as this was made from ferrious bromide, Dr. Lawrence Wolf, a well-known pharmacist of this city, adapted the following method:—

In a stone jug containing about one gallon of water and two-and-a-half pounds of iron turnings, or wire, five pounds of bromide are gradually added, care being taken not to allow the temperature to rise to high, the jug, besides, being placed in cold or iced water; as soon as the reaction has ceased the solution of the green ferrous bromide is filtered off, the remaining iron being well washed out with warm or boiling water, and to it, in a leaden or glass flask, fifteen pounds of commercial sulphuric acid are added. After the mixture has sufficiently cooled six pints of alcohol (95 per cent.) are intermixed, the mixture well agitated and distilled at a temperature of 200°F., and there maintained until the reaction, which will go on quite lively for a while, shall have ceased, and the ethyl, which has rapidly been gathering in a receiver containing about one ounce of water, has ceased to come over, as can easily be detected when it fails to further sink to the under surface of the layer of water. The ethyl bromide so obtained should be shaken with a solution of potassic bicarbonate, subsequently washed with water and purified by re-distillation.

Dr. Wolff says that he has obtained in this way and from these amounts seven pounds of ethyl bromide, at a cost of not over $4.30, or about 60 cents per pound.

Thus, if ethyl bromide can be manufactured at this very low cost the objection that Nunneley found will not prevent the article from being used.

At the Pennsylvania Hospital the first twenty-five administrations consumed nearly twelve fluid ounces, or about eighteen ounces avoirdupois. The retail price at that time was $3.00 per pound, thus making the total cost $3.37½. The average amount used in each case was 3 9-10 fluid drachms, costing 13½ cents for each patient.

The cost is governed by the manner of using. If given in the bungling and wasteful manner so often seen in the use of other anæsthetic agents, I can readily understand how the cost would be a decided impediment to further use; but if administered as I shall detail later, any one can gain the results obtained above in similar cases.

ITS PHYSIOLOGY.

There exists such diametrically opposed opinions with reference to the physiology of this agent, that, instead of discussing them, I shall merely allude to the views held by different investigators and await the results of further experiments.

Dr. H. C. Wood, of Philadelphia, deduces from his experiments on animals that anæsthesia may be obtained without reducing the blood pressure, but when given in excess it becomes a distinct depressant to the circulation, reducing the current of blood to a marked extent.

M. Terrillon, of Paris, says that in no case has he observed any phenomena the nature of which would cause fears of asphyxia; neither does ethyl bromide seem to cause syncope.

Dr. Levis observes that as anæthesia progresses the general circulation shows evidences of moderate excitement, indicated by some increase in the rapidity of the action of the heart and increased arterial tension, the face becoming brightly flushed. Nor does he seem inclined to think there is any likelihood of cerebral anæmia or cardiac syncope; and he further observes, that all anæsthetics become eventually, by continuance, depressing agents.

Dr. W. H. Hingston, of Montreal, notices in man an increased frequency in the heart action, together with an increased respiratory movement, and that the pulse and breathing are less influenced than with ether or chloroform.

Dr. Lawrence Wolff, assisted by Dr. J. G. Lee, Physician to the Coroner of Philadelphia, experimented quite largely with rabbits, and observed that those animals which died, to whom respectively ethyl bromide and ether had been administered, presented similar phenomena.

The mode of death appears to have been by gradual paralysis of the cardiac inhibitory motor centres; while the sudden heart failure in the animal to whom was given chloroform, which is typical of chloroform accidents, seems to indicate paralysis of the cardiac motor centres.

Dr. Wolff believes that these experiments go far to show that a direct toxic inuefince from pure bromide of ethyl need not be apprehended.

Dr. Ott, of Easton, Pa., who has made thorough and scientific researches with the bromide of ethyl, experimenting upon frogs and rabbits, believes that the increased frequency of the pulse is due to stimulation of the accelerative nerves, or of the cardio-motor ganglia, and the dangers in administering the drug are less then those of nitrous oxide.

MODE OF ADMINISTRATION.

It is of great importance that a preliminary drill should be gone through before commencing the administration of any anæthetic, that the patient may know what is required of him and co-operate with the administrator. The assurance of freedom from suffering and danger go far to tranquilize the patient's mind and render him willing to observe such directions as it may be advisable to give him.

I cannot too greatly deprecate the careless manner in which anæsthetics are administered, it being an extremely rare occurrence for the patient to have his heart or lungs examined prior to the administration. A careful physical examination should be instituted in every case about to pass into the anæsthetic state, and should signs be present of affection of either of these organs, the administrator would feel increased responsibility, and would be more watchful for the slightest indication of trouble. But the frequent administration of anæsthetics at the present day, together with the rare occurence of death, has tended to a disregard of danger.

The use of cumbersome mechanical apparatus for the administration of anæsthetics has no advantage over the simple napkin, as used by Dr. Levis.

It is recommended that a folded napkin large enough to cover the entire face be used, and upon the centre of this be pinned several folds of soft linen, about four inches square, upon which is poured, in measured quantities, the anæsthetic.

The patient being upon his back, with his head slightly raised, the preliminary drill having tranquilized him, the napkin is placed over the patient's nose and mouth, and a rapid, decided impression aimed at. The object is to obtain the anæsthetic state as soon as possible, without the intervention of muscular or mental excitement.

The anæsthetic state is usually indicated by a return to normal breathing, resembling that of ordinary sleep.

When this condition is reached the application should be continued only as needed to keep the patient in this condition. It must be remembered that all anæsthetics become depressant when pushed to their toxic effect.

Vomiting is less frequent than in the administration of ether or chloroform—Terrillon, Fere, Hingston, Conner, Roberts, Turnbull, Levis—while Agnew, Haynes, Morton and Prince think that it occurs more frequently.

It seems impossible to reconcile these views, unless allowance is made for the impurity of the earlier samples, and the manner in which administration was conducted; for when given as Dr. Levis recommends, I am certain that vomiting is very much less frequent than when ether is given.

The condition of the patient's stomach is, of course, a very important matter, and it is well to have the patient abstain from solid food for at least four hours, and liquids three hours, before being anæsthetized—(Levis.)

Fere recommends that a fast should be taken from the night before the operation. This may account, in part, at least, for his uniform good results in the administration.

The occurrence or threatening of vomiting during the progress of anæsthesia indicates that the anæsthetic state has not been reached, and an effort should be made to push the ethyl bromide. It must be borne in mind that a fully anæsthetized patient never vomits.

After the completion of the operation, should nausea present itself, small pieces of ice may be ingested, with decided benefit. The patient should be kept in the recumbent position until all tendency to nausea has subsided.

The ethyl bromide is not available, in my experience, in operations about the nose and mouth, when it becomes necessary to suspend the administration for a time, for the rapid elimination alows the patient to return to consciousness, which is apt to be accompanied with more or less struggling.

After complete anæsthesia has been produced by ethyl bromide, I have found it practicable to continue the anæsthesia by the use of sulphuric ether, which has the advantage, and at times the disadvantage, of keeping up the anæsthetic state a considerable time after the napkin has been removed.

In operations lasting over one hour, it is probably safer to keep up the protracted impression with sulphuric ether; but I can conceive of but few operations which would require such a length of time in performing.

The quantity to be used in operation must of necessity be governed by the condition of the patient and skill in the administraton. In a recent case of scirrhus of the mammary gland, upon which Dr. Levis performed excision, I administered seven and one-half drachms of Wyeth's ethyl bromide, keeping the patient completely under its influence for fourty-two minutes. Five minutes after removing the napkin the patient conversed rationally with those about her. In this case there was no nausea, vomiting, or other unpleasant symptom.

The largest amount I have personally known to have been given was eleven drachms during forty minutes, in a case of amputation of the arm, by Dr. Lewis. I am unable to understand the necessity of giving the large quantities said to be required (?) in many of the cases where deleterious defects have been noticed or where anæsthesia could not be obtained.

In the case of Dr. Sims, of New York, it is stated that two ounces had been administered during the first twenty minutes, at the end of which time she vomited freely (showing she was not thoroughly anæsthetized.) The operation (Battey's) lasted one hour and a half, and about five ounces of the ethyl bromide were used.

It is, of course, a well known observation that those accustomed to alcoholic stimulants are with greater difficulty brought under the influence of anæsthetic agents, but this will not account for all the cases where "it became necessary to resort to ether or chloroform."

In reference to the only case of death occuring while under the influence of ethyl bromide, that occured at the Jefferson Hospital, on May, 26th, 1880, I will briefly state that the patient was in a very debilitated condition, but after being in the hospital week after week, with the intention of improving his condition, and warm weather rapidly approaching, he protested against further delay. A consultation being held, an attempt to remove the vesical calculus was deemed advisable.

On May 26, 1880, after the administration of a stimulant and fifteen grains of quinine, two fluid drachms of ethyl bromide were given by the resident surgeon. Soon after the patient struggled, then a third drachm was given. A fourth drachm was given later, and anæsthesia was accomplished. Dr. Levis made the incision, when a gentleman who has acquired a well-desirved reputation as an administrator of anæsthetics called attention to the imperfect respiration. The napkin being removed, the lips were noticed to be of a pinkish color, cyanosis apparently not existing.

Let it suffice to say, that nitrite of amyl, the battery, and artificial respiration were resorted to, and not until an hour had elapsed were the efforts suspended.

The post mortem examination was held two hours after death, by Dr. J. G. Lee, Coroner's physician. Dr. Lee was peculiarly fitted to make the autopsy in this case, inasmuch as he had experimented quite largely with animals, in connection with Dr. Wolff.

He found the following conditions present:—

Commencing rigor mortis. In left perineal region an incision two inches long penetrating skin and superficial fascia. Tissues of scalp congested, membranes of the brain congested, ventriles containing a small amount of clear serum, brain substance normal; membranes of medulla oblongata congested; substance of medulla anæmic. No odor of ethyl bromide perceptible. On opening body, some slight odor of ethyl bromide was noticeable. The apex of left lung was bound to thoracic walls anteriorly and posteriorly by old (circumscribed) pleuritic adhesions. Upper lobe was partially consolidated, the lung tissue containing a number of cavities, with caseous and purelent deposits.

Upper and lower lobes of right lung bound to thoracic walls anteriorly and posteriorly, by old pleuritic adhesions. Lung tissues consolidated and filled with cavities of various sizes. Trachea and bronchi contained a small amount of pus, otherwise normal.

Right side of heart dilated, auricle and ventricle containing post-mortem clots, concentric hypertrophy of left ventricle, which has contracted, and contained a very small post-mortem clot. Left kidney enlarged and diseased; right kidney enlarged. Liver normal. Intestines normal. Concentric hypertrophy of bladder, which contained at its neck two encysted calculi.

Dr. Morris Longstreth, pathologist to the hospital, made microscopic examinations, and reported as follows:—

Kidneys show inflammation of pelvis, extending to entire organ. The morbid process in the lung was catarrhal pneumonia; no tubercular deposits were to be seen.

The coroner's jury rendered the verdict of death from exhaustion, due to disease of the lungs and kidneys.

I think that the case teaches one very important lesson, that a careful physical examination should be instituted in every case, prior to administration of an anæsthetic. Had this been done in this case, I question very much if the operation would have been attempted.

SOME VIEWS AS TO THE VALUE OF ETHYL BROMIDE AS AN ANÆSTHETIC.

Dr. A. W. Adams, of Colorado, says, from his small experience in its use, that in view of its patent virtues, *i. e.*, its rapid impression, the promptness of recovery from its influence, its agreeableness, and the non-cumbustible character of its vapor, it is worthy of a most extensive trial and investigation.

Dr. J. C. Reeve, of Dayton, Ohio, remarks: "My personal experience with hydrobromic ether fully sustains the observations of others as to its exceeding promptness of action, and the rapidity with which recovery takes place. I can also say that it is pleasanter to inhale than chloroform, which is not very unpleasant, and infinitely pleasanter than ether."

Dr. Woodbury, of Philadelphia. Editorial. "It is probably safer than chloroform, having much the same advantages over ether that chloroform has. But let it be understood that there is no such thing as a perfectly safe anæsthetic."

Dr. H. C. Wood. "If any reader will examine the sudden fall of arterial pressure in Experiment 3, and remember the great expensiveness of the bromide, and the lack of any anæsthetic superiority on its part to chloroform, he will, I think, hesitate about endorsing this new agent."

Dr. Ott draws the following conclusions:—

1. "Bromide of ethyl, by ether inhalation or subcutaneous use, kills by a toxic action on the centre of respiration.

2 "That the decrease of force and frequency of the heart contribute to the paralysis of the respiratory centres.

3. "That injections of ethyl into the jugular toward the heart kills by cardiac arrest, probably due to an action on the cardiac muscle.

4. "Bromide of ethyl in toxic doses depresses momentarily the frequency of the heart, followed by a subsequent permanent rise to normal rate.

5. "Bromide of ethyl in toxic doses depresses the actual tension steadily, due in major part to the depressant action of the drug upon the heart; and in minor part to a partial loss of tone of either the spinal vaso-motor centres, or the peripheral vaso-motor system.

6. "The inhibitory power of the pneumogastric is not paralyzed."

Dr. Wolff. "That pure ethyl bromide is, *per se*, an absolutely safe anæsthetic, can, as yet, not be positively stated, but that its action appears to be quite as safe as ether, and certainly more so than the treacherous and dangerous chloroform, seems to us, as a deduction from above related experiments, out of question."

W. H. Hingston, Montreal, Canada, has used no other anæsthetic since commencing the use of bromide of ethyl. There is less resistance and struggling on the part of the patient. Vomiting is less frequent. Eliminated from body more rapidly than any anæsthetic except laughing gas.

"That bromide of ethyl is one of the, and in some respects the, most valuable anæsthetic hitherto used."

Dr. Sims, of New York. "The inference that I draw from the facts in the history of this case is that the anæsthetic was the cause of death, while the manner of death may have been by uræmic poisoning. The lesson from this is, never to give bromide of ethyl in prolonged operations, and never to give it where there is organic disease of the kidneys. What, then, shall we give?"

Dr. Levis. "It is becoming evident that the dread of unavoidable disasters from chloroform and the inconvenience of ether are tending to prevent their humane administration in many cases where the blessing of anæsthesia is due to the sufferer.

"While feeling inclined to impress caution in regard to the use of so powerful an agent as the bromide of ethyl, I am, from a basis of experience, inclined to recommend its use to the profession, and express my conviction that it is practically the best anæsthetic known to the profession."

USES OF ETHYL BROMIDE OTHER THAN ANÆSTHETIC.

Dr. Roberts, of Philadelphia, records a case of angina pectoris to which he was called that yielded quickly to the anæsthetic use of ethyl bromide.

The ethyl bromide has gained a place in obstetric practice, owing to its speedy action. In some recent cases where I have used it, it has given the greatest satisfaction. A single drachm administered at every premonition of a labor pain carried the otherwise suffering woman through it without complete loss of sensibility, and yet in a perfectly painless state, the process of labor apparently not being retarded.

In two cases of lumbago and one of sciatica I have administered the ethyl bromide hypodermically, in doses of ten and fifteen minims, gaining the same results that are obtained by similar applications of chloroform. The patients complained only of a sensation, first of warmth, later of numbness, for some considerable distance about the seat of puncture, which passed off in the course of a few hours. The pain in each case was very speedily relieved, and in the case of sciatica did not return after the third injection, (one having been given on each day).

Dr. Wolff, while testing the action of ethyl bromide upon himself, when taken internally, was suffering with a sick headache, which the drug in question seemed speedily to relieve, and he infers therefrom that cases of nervous irritation and hysteria may receive great benefit from its use.

Dr. Turnbull has used, at his ear clinics, the ethyl bromide, by means of the Politzer bag, for inflating the middle ear, and is much pleased with its action. Upon his recomendation I have used it several times, and am inclined to regard it as a valuable acquisition in the treatment of ear diseases. I have not used it often enough to base any conclusions upon its benefits.

Thus, it will be seen that the ethyl bromide has been used with success as a general anæsthetic in surgery, gyæcology, dentistry, in a case of angina pectoris, and other painful afiections; as a local anæsthetic in nunerous cases not recorded; by inflation in the treatment of tinnitus aurium; internally, for nervous headache; and hypodermically in lumbago and sciatica.

If a medical agent possesses such a large range of usefulness, and when administered judiciously has yielded such good results, while in its infancy, is it not proper that it should be given the benefit of a longer and more cautious trial, that its proper position may be assigned to it?

That it has been useful connot be doubted. That it is capable of producing death should be no bar to its proper use; for, in such view, it would become necessary to strike from our materia medica a long list of remedies without which we would be at a sad loss.—*Medical and Surgical Reporter.*

ARTICLE II.

Diagnosis of Malignant Tumors of the Upper Jaw in Youth.

L. MC LANE TIFFANY, M. D.

Professor of Operative Surgery, University of Maryland.

Malignant tumors of the upper jaw occurring in childhood, are characterized by extremely rapid increase at the expense of surrounding tissue. Removal, to be effective, should be complete and an early diagnosis is absolutely essential that the surgeon may offer to his patient reasonable hope of cure. With the laudable intention of assisting the diagonis, the following cases are related and commented upon:

Case 1. A. S., of Harford County, aged 9 years, female, suffered some slight pain about the right upper canine tooth, not sufficient, however, to attract more than passing notice. Two weeks later a slight fullness appeared by the side of the tooth at the border of the gum; this increased, was considered to be "proud flesh" and touched with lunar caustic. The caustic failing to arrest growth the case was sent to me. I found a soft, vascular, bright red, tumor, partially surrounding the canine tooth, involving the gum, and manifestly growing from the alveolar border of the jaw. Handling caused some bleeding, increase of the tumor in size was said to be rapid. A diagnosis of sarcoma was arrived at. Removal was effected by extracting the canine and two adjacent teeth, then cutting away the gum and alveola border with forceps. Hæmorrhage was slight and the patient returned home in a week.

Three weeks later A. S. again consulted me.

Protruding from the upper jaw in the gap left by the former operation was a red tumor adherent by a broad base. The growth was about the third of an inch in diameter, the progress of three weeks; evidently the first operation had not reached the spot from which the tumor originated. Unwilling to remove the upper jaw and mindful of the fact that the upper jaw at the age stated has a broad alveolar border, I operated as follows through the mouth, so as to cause no scar, a matter of prime importance in the female; the cheek and lip were freely dissected from the bone as far up as the infra orbital foramen, all teeth posterior to the lateral incisor were extracted, and then with strong forceps having blades set at angle to the handles the whole alveolar border was removed, the line of section running from above downwards and without inwards. The line of section was so directed as just not to open the nasal cavity. Chloride of zinc pure, was rubbed into the exposed bone surface.

To avoid the inconvenience which would result from the passage of blood into the trachea, as well as the danger, the operation was done with the patient resting on the belly, the head raised facing a window, supported of course by assistants. The lateral light illumined the mouth well, and the blood ran at once from the mouth to the floor, not passing backwards, which indeed would have been up hill. This device of position rendered the operation easy and simple. Some little hænorrhage occurred during the afternoon, which however, was arrested without much trouble, after which all went well. After treatment consisted of mouthwashes and tonics, the wound healed over rapidly and no deformity was present. A set of teeth will be adjusted at the proper time. It is now five and a half years since the operation was performed and recurrence has not taken place. Microscopic examination showed the tumor to consist of round and spindle cells, vessels, delicate connective tissue.

Case 2.—W. O., male, from Cecil county, aged 18 months, was sent to me, with a history extending over one month only. A lump was first noticed at the free border of the gum corresponding to the first molar; the lump grew rapidly and bled on handling. Nitrate of silver had not arrested progress. Examination showed a soft, bright red, moderately formed tumor the size of a pea, attached to the alveolar border of the jaw by a broad base. Removal was effected as in case No. 1. The same position facing a window was made use of with equally happy effect. Two years later when heard from, recurrence of the growth had not been observed.

Case 3.—I. B., aged 16 years, of Baltimore county, female, noticed a swelling of the left upper jaw, and attributed it to a tooth. Enlargement increased, remaining hard however, an exploratory incision was made giving exit to blood only. I. B. then had a tooth extracted, but failed to diminish the size of her jaw. Four months after the commencement of her trouble she was referred to me by her attending physician. I. B. was a large, well formed, healthy girl, functions said to be regular. The left upper jaw was the seat of a tumor partly covered by bone, partly not, firm, elastic, extending from the middle line in front to the last molar tooth not encroaching upon the nostril, not involving the hard palate beyond the middle line. A finger passed up behind the soft palate showed the growth in that direction to be limited by the maxilla. While the tumor distended the cheek, the skin was not involved. The eye was not protruded, although the swelling extended to the floor of the orbit. Growth during the last six weeks very rapid. Diagnosis, Sarcoma. Treatment, removal of the upper jaw with tumor. This was effected on January 7th of this year; chloroform as the anæsthetic, for the use of Paquelin's cautery was intended. Laryngo-Tracheotomy was effected, the incisions being made with the gas cautery, because the patient had a vascular goitre encroaching upon the crico-thyroid space; notwithstanding the knife was used at red heat and slowly, a large vein required ligature. A tube being inserted in the windpipe anæsthesia was kept up through it, and the operator thus gained undisturbed possession of the mouth. The pharynx and mouth were stuffed with sponges. An incision was carried through the lower lid, commencing just external to the puncture downwards by the nose, around the ala and through the middle line of the lip, thus forming with lid and lip a large quadrangular flap. This flap was reflected so as to thoroughly uncover the jaw tumor, the central left incisor was extracted, the alveola border and hard palate were divided with saw and forceps, the soft palate was divided by the cautery. The nose was separated from the left jaw and turned to the right. The eye was raised with soft parts from the floor of the orbit and held up, one blade of cutting forceps was put in the orbit, one in the nose, and the intervening bone cut through. The malar-maxillary jointing was divided with saw and forceps, the jaw was then grasped with strong pliers and twisted from its bed. But little hemorrhage occurred, the cheek flap giving most blood and required a touch or two with the cautery. Collapse came on suddenly, necessitating lowering the head and hypodermic injections of whiskey. The patient reacting, was put to bed with hot bottles. Wound was united by suture. Recoverywas retarded by a slight facial erysipelas which caused the lower lid to unite with a small depression, abscesses formed at the site of several hypodermic punctures in the limbs. The cavity left by removal of tumor was syringed several times daily, and the cheek supported by a pad of oiled oakum.

At present time patient is quite well, a slight V in the lower lid shows where the erysipelas retarded union; this can be corrected easily however. The soft palate has been preserved. Microscopic examination showed the tumor to be composed of spindle cells with but scant intercellular tissue and many vessels. A spindle cell sarcoma; no myeloid cells found.

No glandular affection was present. The cases related have certain points in common worthy perhaps of notice. The patients were all inhabitants of the country, and in robust health. I am not aware of any observations tending to show that town-people are in any way exempt from jaw tumors, more than the extra urban population. Age, rapidity of growth, absence of pain, locality affected, were common to all, and indicate, of course, sarcoma, confirmatory evidence of the same being supplied by microscopic examination of the removed growths.

The disease in cases one and two probably started from the periosteum lining a tooth socket, and growing in the direction of least resistance, first appeared between the tooth and gum, increasing rapidly. This would correspond to the clinical life of a periosteal sarcoma, which is no sooner freed from pressure than it sprouts quickly and dispenses with the bony plates in which it clothes its early increase; indeed, sarcoma, periosteal or not, projecting into a cavity grow rapidly and become pedunculated.

Polyp of the dental pulp, as described by Tomes, and exuberant granulations protruding by the side of a decayed tooth, present a certain resemblance to the first appearances noticed in cases one and two, but the absence of all pain, throbbing, œdema or decay, and the failure of nitrate of silver to arrest progress, led at once to the proper diagnosis and institution of treatment. Case three, however, was of a more serious nature, the morbid growth commencing probably in the body of the jaw, showing no tendency to appear by the side of a tooth but increasing in the direction of the cheek as well as towards the mouth; a typical case of the severest form of jaw tumor. Sarcoma of the upper jaw is the privilege of youth, rarely being observed after the 24th year. A cause is generally wanting, and while nasopharyngeal polyps are more often found in males, the growth in question affects the two sexes about equally.

Progress is rapid, and increase takes place in the direction of least resistance, namely, towards the cheek and mouth. Protrusion of the eye from pressure upwards upon the floor of the orbit, and interference with the passage of air through the nostril are symptoms of very late occurrence, and indicate a growth within the antrum, or from the base of the skull, rather than from the body of the bone. Invasion is insidious, attention being attracted by increased size at the affected locality more often than by pain or loss of function, both of which symptoms are absent until a late stage of the disease.

Increase of tumor while surrounded by bone is usually not very fast; the bone being perforated, rapid increase occurs with pedunculation, but without hemorrhage, if upon a mucus surface; no pedunculation, but always hemorrhage upon a skin surface, a fact of some clinical interest. Glandular infection wanting always. The shape of the tumor is defined by the jaw with a general tendency towards knobby and rounded outgrowths. A thermometer will show the temperature of the growth to be two or three degrees (2° or 3° F.) higher than the corresponding point on the opposite side of the body a fact, inflammatory symptoms wanting, which has ominous clinical importance. This is true, whether the temperature be taken on the skin surface or in the mouth. Estlander of Helsingfors, Finland, in 1878, called attention to elevated temperature in Osteo Sarcoma, and this I have confirmed in several instances. When not covered by bone the growth imparts to the fingers of the examiner a sensation as of a tense elastic body, with perhaps false fluctuation enough to deceive even the most wary; especially do rounded outgrowths present this peculiarity.

Cystic tumors of the upper jaw sometimes expand the bone until it is of parchment thinness, and give a sensation as of crackling when handled and pressed. I am not aware that solid malignant tumors present this symptom ever. No part of the body is more accessible for diagnostic purposes than the upper jaw, the natural openings of mouth, nose and orbit afford means of explorations in three directions, while a finger passed up behind the soft palate can reach the base of the skull and thus examine the posterior surface of the bone. The remaining bone surface, its condition, can be appreciated through the cheek. Round and spindle celled sarcomata increase with rapidity, the presence of myeloid cells (myeloplaxes) indicates slower growth. An incision into the tumor is sometimes required in order to verify the diagnosis; it is always proper before operation. From sarcoma dental abscess and suppuration in the antrum are distinguished by symptoms of inflammatory actions, also incision yields pus.

A dentigerous cyst occurs during the period of second dentition, forms about a misplaced tooth which is wanting in its proper situation, approaches the surface and gives to the fingers a sensation of cracking, is rarely of large size; incision yields thick, clear fluid, and discloses the missing tooth. Diagnosis of dropsy or of polyp of the antrum, is never absolute without incision. The different varieties of odontoma as described by Broca offer no difficulties of diagnosis.

Prognosis. Very simple, progressive increase and death by repeated hemorrhages, or by interfering with necessary functions, *i. e.* respiration or deglutition. Treatment consists in removing the tumor, together with the bone from which it grows, otherwise there is local recurrence, and it is better to cut freely where there is doubt as to the amount of bone involved rather than to leave tissue which may become the nidus of future reproduction.

Reflecting the lip and cheek if tumor is small, and cutting as in cases one and two, in view of the cure affected seems worthy of commendation. By this method a large amount of bone can be removed through the mouth without cutting the face. The position also in which the patients were placed, with the head somewhat raised, facing a window, gave a good light and obviated all danger of blood entering the air passages; thus removing one anxiety from the mind of the operator.

Case 3 required a more serious procedure than either of the others. The usual skin incision was not adopted, but the lower lid was divided and the opening between the lids utilized instead, carrying an incision acrossthe face below the orbit. By this means an additional scar upon the face was avoided, and the large quadrilateral flap containing the facial nerve and artery uninjured, being reflected thoroughly exposed the jaw.

The performance of tracheotomy prior to removing an upper jaw is not usually considered necessary, but the comfort to an operator of knowing that respiration will not be interrupted by flow of blood, and of having entire control of the head, can scarcely be overestimated, and greatly outweighs any possible risk from the neck wound. The crico-thyroid membrane was opened with the thermo-cautery and was not attended by the usual cough and splutter which follows the ordinary method by bistoury. There was no accelerated respiration or struggle, but breathing went on undisturbed through the neck. To me the experience was most singular, and I shall not fail to repeat it when opportunity presents.

I am not aware that tracheotomy with Paquelin's cautery has been often done in this country, if at all. While the first case of upper jaw removal, successfully, is credited to Jamison, of Baltimore, in the early part of the century, it does not appear to have been repeated in this city until 1875, when it was by Christopher Johnston, M. D. The patient was exhibited at the Clinical Society 2 years after the operation; the deformity was very slight. In that case Diffenbach's line of incision was followed.

ARTICLE III.

Robert Arthur, M. D., D. D. S.

BY W. W. H. THACKSTON, OF VIRGINIA.

Private advices, and the professional Journals, have brought to us the announcement of the death of Dr. Robert Arthur, of the city of Baltimore.

This sad event occurred July 23rd of the present year, in the fortieth year of a professional career, in which Dr. Arthur stood in the fore front of that wonderful progress, which has marked the four past decades of dental history. Forty years ago, the Baltimore College of Dental Surgery (then the only institution of its kind in the world,) presented as its first offering to science, Robert Arthur; and had that college, whose subsequent labors and influence have remodeled, and reconstructed, and elevated and advanced dental science and dental practice throughout the world, done nothing more than produce *one* such representative of its teachings, that enterprise would not have been founded in vain, but would have deserved, and commanded the admiration and applause of men, and fully compensated all the efforts and labors for its establishment.

Immediately after graduating, Dr. Arthur commenced the practice of his profession; and very soon took high rank as a skillful operator, a close observer, and faithful student. His research and studentship did not end with his graduation, but only terminated with a life of indefatigable industry and enlarged usefulness.

Such was Dr. Arthur's standing and reputation that even in this early period of his professional career—while just in the dame of his manhood,—he commanded the recognition and engaged the confidence and esteem of the leading members of a profession than struggling for improvement for position, and for legal existence. The success of the school in Baltimore, having demonstrated the value and importance of the system upon which this former institution was founded; it was determined to establish a similar school in the city of Philadelphia, and it was no surprise to the dentists of that day, that Dr. Arthur was promptly called to fill one of the most important professorships in the "*Pennsylvania College of Dental Surgery*;" nor was it a surprise to any one acquainted with his talents and acquirements, that the duties of his responsible position were so discharged, as to reflect the highest honor upon him as a teacher, to enhance the reputation of the school, and to confer the largest benefits and advantages upon the classes to whom he lectured.

Professor Arthur's position as an instructor and educator, extended his acquaintance with men of science, brought him into association with savans and scholars, increased his already high reputation, and enlarged the sphere of his professional practice. After several years of successful and brilliant service as a leading member of the Faculty of Instruction in the Pennsylvania College, Dr. Arthur found himself antagonized by some of his colleagues (as well as we now remember) in respect to questions of an ethical character, in the conduct and management of the school and the remonstrance of the "Board of Visitors," and to the profound regret of the students and patrons of the college, he resigned his Professorship, and permenantly terminated his connection with the educational institutions of his profession, except as to the various associations and conventions of which he remained an honored and highly distinguished member, to the end of his life.

Dr. Arthur's talents and abilities found ready recognition and acknowledgement abroad; and the Odontological and other societies of Europe, honored themselves by confering upon him the highest distinctions within their gift. His views were eagerly sought and discussed, and his improvements and advances largely accepted and adopted.

From many influential sources, Dr. Arthur had been urged to relinquish his connection with the Pennsylvania College, before he finally determined to submit his resignation as a professor. Finally, he yielded to the importunities of his Baltimore friends in so far as to return to the "Monumental City" and there to spend the remainder of his busy life, dispensing the benefits of his skill and learning to those who sought his services. And we do not think it extra urgent to say, that few, if any, ever enjoyed a higher or more appreciative class of patrons in the history of American Dentistry.

But amid all the stretch and strain upon his strength and energies and as a popular and approved operator, Dr. Arthur never relaxed his efforts from the growth and development of his loved profession. He continued *to study, to think, and to invent.* The current literature of the profession has for nearly forty years, enriched by contributions from his facile pen, and many valuable additions have been made to our stock of knowledge, to the instruments, the material, and the resources of operative dentistry by his fertile and teeming brain.

In this hurried sketch, we cannot recall attention to all the many valuable papers attributed to dental science by our lamented friend, but will content ourself with the mention of a few, which suggest themselves as we write. The exhaustive report upon the "Dental Literature of the World" made before the old "American Society of Dental Surgery," in the year A. D. 1850 or 1851, was a paper of great research and accuracy, and of inestimable value to the student of science. This report was written in a style that stamped Dr. Arthur as a man of broad professional culture, and of classic skill and taste in the realm of letters. Subsequently the publication of his monograph upon the "adhesive properties of annealed gold foil," giving to dental practice, essentially a *new material*, or rather an old material so modified in its character, as to largely supersede all other forms of gold, and revolutionize the grand operation of "tooth-filing" the world over, added to the high reputation its author had already achieved. Many other articles and essays having the stamp of thought, of research, and of genius, may be found illuminating the pages of our current journalism, but we have neither time or space to comment upon these in this article.

Perhaps the most noted and important of all Dr. Arthur's contributions to the profession he so highly honored and adorned, was his work on the "Treatment and Preservation of the Teeth."

The form in which this book was given to the profession, provoked at the time of its appearance, the sharp criticism of some of the "journals," both at home and abroad. The *popular* style adopted by the author, was regarded as objectional, and as a departure from strictly professional usage, and the doctrine taught and maintained, did not receive the sanction or approval of many of the leading practitioners of the day. But, however well founded some of these objections and criticisms may have been, it nevertheless cannot be denied, that the work was a great addition to the literature and operative resources of dental science, that it evinced close observation, patient investigation, a high order of talent, and a most refined and cultivated scholarship.

It may now be safely asserted, that the prophylaxis and treatment of decay of the teeth as taught by Dr. Arthur, has been largely adopted by many of the most distinguished and reputable dentists of the world, and that the results of such treatment and practice, have abundantly demonstrated its value and importance in the salvation of human teeth. In making this assertion, I mean the *true and exact teachings of the work*, *not* the crude conceptions and total misapprehensions of Dr. Arthur's theory and practice that we have seen published in some of the Journals and Reviews, *not* the muddy and opaque ideas that have occasionally found flippant expression in our *societies* and *conventions*, but a clear understanding of the author's meaning, and a faithful application of the principles, the methods, and the operations prescribed.

No man living or dead, has contributed more to perfect the operation of "tooth-filling," than Dr. Arthur; no one had a higher appreciation of the value and effectiveness of that particular means of "tooth saving," no one more unhesitatingly performed the operation whenever and wherever indicated, and few if any, performed the work with more skill and judgment, whether the material employed was soft gold or crystal gold, or hard adhesive gold foil. As far as the writer has had opportunity of examining Dr. Arthur's fillings, he found them masterpieces of faithful finished workmanship. It was a total mistake that he disapproved the operation of "filling," or in any way discouraged its employment. But Dr. Arthur believed and taught that with the best and highest efforts of human skill, and with the greatest attainable perfection in material, in instruments, and in operative ability, that a tooth filled upon its *proximate surfaces* was not as effectually preserved, or with equal value with one, in which decay had been anticipated and prevented, or having occurred, had by a timely operation of a different character been swept away, leaving sound, healthy, highly polished and self cleaning surfaces, with comparatively little mutilation, and scarcely appreciable impairment of the natural symmetry of the organ.

We suppose no one will deny to Dr. Arthur the credit and honor of discovering the peculiar properties of what is now known as "Annealed" or "Adhesive" gold foil which made possible and practicable, the filling, and building up and contouring, and preserving for indefinite usefulness, all decayed and broken down teeth capable of restoration by this operation. He so taught in his last book, and so practiced in his daily ministrations to the needs of his patients. Upon the grinding, the buccal, the lingual, and labial surfaces of the teeth-fillings of gold, glitter and sparkle all along his professional pathway, and upon the proximate surfaces, where the progress of decay made a filling necessary, there it will be found, in all the teeth that came under his eye and hand.

But however dentists may differ as to some of Dr. Arthur's advanced ideas of Theory and Practice, all will unite in the acknowledgement of his eminent ability, and unflagging industry; all will acknowledge the debt of gratitude his labors and achievements have imposed, and all will embalm his memory, as one of the high and honored of our calling, as a good and a great man who has fallen at his post. It is no disparagement of our illustrious dead, or of our distinguished and honored living to say that Robert Arthur was the equal, the peer of the most exalted of them all; and to-day, American Dentistry stands bereft of one of its brightest exemplars and grandest representatives. Alas! alas!

In the private and social relations of life, Dr. Arthur was no less a man of mark than in the public and professional positions which he so highly honored and adorned. With a great and warm heart, and a massive intellect strengthened, cultivated, and refined by life long study of the models of classic and modern genius, the languages and literature of the past and the present, he was a most instructive and charming companion, and with those who engaged his confidence and esteem, a most disinterested and devoted friend. Unostentatious, modest, and diffident almost to a fault, he made no parade of his extraordinary abilities, or brilliant acchievements, and it was often a source of painful and almost crushing disappointment that he found his highest and grandest efforts in behalf of his profession so often misapprehended and misinterpreted, by the very class of men, that he had labored and struggled to benefit and improve. But in the silence and the seclusion in which all sensitive natures take refuge, he worked on, trusting for his recompense and reward, to the consciousness of his integrity, and in the firm faith, that ultimately his work would be understood and appreciated; his fellow men benefited and advantaged, and that posterity, would accord to him the justice, and honor, often withheld by his contemporaries. And so it will be.

The last few years have witnessed the fall of many of our high and honored men; death has shot his arrows at our most shining marks, but it may be safely said, that no more distinguished representative of our profession, no more elevated or exemplary character, no truer or brighter exemplar of all that dignifies and ennobles humanity has been cut down, than Robert Arthur, of Baltimore. Peace to his ashes, and forever honored and cherished be his memory.

ARTICLE IV.

History of Diploma Selling.

The history of the fraudulent medical colleges of Philadelphia is one that is humiliating to every American. It is not alone that such institutions existed, but that they existed and flourished with increasing prosperity for more than a quarter of a century. But though, on this account, some reproach falls upon all, the keenness of disgrace touches especially the city of Philadelphia. Her civil authorities had long known that this business was going on, and that ignorant men were every year being clothed with the responsibilities of the physician. Yet they did nothing in the matter. Her medical men were no less aware of the iniquity. But from her famous colleges, her historic societies, her immortal leaders in medical science, there came no effort to clear the reputation of the city or the profession. The editor of a penny newspaper has done more than all the organized strength of the profession to destroy the diploma-mills and remove the stain upon the medical pre-eminence of Philadelphia. This is not a very proud moment for the physicians of that city. She has lost her prestige as a legitimate medical centre, and has won the reputation which comes from issuing her thousand spurious diplomas.

There is every prospect now, however, that the career of these colleges is at an end. Legal processes have been instituted against the trustees of one institution; the dean of another is languishing in jail; the proprietors of a third will soon have all their powers destroyed and their charter annulled.

The manufacture of diplomas in Philadelphia began in 1853, at which time the Legislature chartered the American College of Medicine. In 1858 the name was changed to the American College of Medicine in Pennsylvania and the Eclectic Medical College of Philadelphia. In the diplomas subsequently issued, sometimes one part of the above title was given and sometimes the other. Various kinds of degrees were confered, but most of them were medical. Finally, a division of the charter and school was made. Dr. Wm. Paine took the American College and Dr. Buchanan, the Eclectic Medical College. In 1865 the name of the American College was changed by the Legislature to the Philadelphia University of Medicine and Surgery. Under this name the institution has flourished for fifteen years and gained a world-wide reputation. Dr. Buchanan, meanwhile, continued his own college, adding other fictitious names to it. In 1872 the State Legislature investigated these institutions. It was discovered that medical degrees were given after a few days' study, and that degrees of all kinds were sold at moderate rates. An instance was cited in which a degree of L. L. D. was confered on a child two years old. In consequence of the revelation thus made, the charters were repealed. Dr. John Buchanan, however, carried his case to the Supreme Court, and showed that the charter of his Eclectic Medical College was given before the Legislature had reserved a right to repeal such instruments. The court sustained the plea, and the college was kept on its feet. The Philadelphia University of Medicine and Surgery did not stand on the same footing with the other college. The question whether the Legislature had a right to repeal its charter is a delicate one, but it seems probable, on the whole, that it had. Dr. Wm. Paine, however, did not choose to go to law about the matter. Instead of this, he took the risk, and continued operations in spite of the repeal.

At about this time the institution was sold out to a ministerial syndicate of four. These persons ran the "University" with great success, it being under the immediate and able control of the Rev. Mr. Miller, Dean, and the Rev. Mr. Ingraham, President. Degrees of all kinds were issued, some of them very novel add ingenious. One of these confers all the privileges and immunities of a physician upon members of the "University Hospital;" another confers the privileges that belong to a student of medicine in the "University and Hospital of Philadelphia." Since 1859 over six hundred medical degrees have been issued from this "University" alone. Most of these were confered on persons in the United States. A full list of the names is published in the *Philadelphia Record* of June 14th. Two hundred and twenty of the persons holding these diplomas live in Pennsylvania and contribute to the elevation of the medical status of that State. New York comes next in number, and has sixty-six. Then follow various Western States, Ohio leading. Ten names are given of persons living in Germany.

While this University was thus in active work, Dr. John Buchanan, with his Eclectic Medical College and other institutions, had been no less busy. The activity of his traffic and the elasticity of his collegiate nomenclature may be best learned from the following: A reporter of the *Philadelphia Record* bought of him, in open purchase:—

One diploma of M. D. from the Eclectic Medical College; two diplomas of M. D. from the American University of Philadelphia; one diploma of M. D. from the National Eclectic Medical Association; one degree of D. D. from the Livingston University; one degree of LL. D. from the American University, and one degree of D.C.L. from the Livingston University.

Only one of the above institutions, the first, so far as we can learn, has even a chartered existence. The Livingstone University is located in Camden, N. J. An attempt was made to get a charter for it from the New Jersey Legislature. This attempt failed, but Dr. Buchanan ran the University just the same, using the alias of James Murray, D. D., Dean.

In addition to the Paine-Miller and Buchanan diploma shops, a quasi-medical college, known as the Electropathic Institute, has been unearthed. By a twenty-five hours' attendance on lectures, and the payment of $50, a degree of Master of Electricity can be obtained, and was so obtained by a *Record* reporter. This degree enables the possessor to treat all diseases, upon the theory taught at the school—a theory which is so unique as to deserve explanation. It is briefly this: No medicine ever cured disease. All diseases are simply disturbances of the electrical currents of the body. Those attended with inflammation, sharp pains, extraneous growths, are simply evidences of too much positive electricity; those attended with dull pains, degenerations, and tendency to decomposition, are evidences of too much negative electricity. To effect a cure it is only necessary to change the abnormally negative to positive, or *vice versa.* Upon these theories the Electropathic Institute did its work, and graduated its students. Strange to say, it had received the indorsement of a number of prominent and presumably intelligent Philadelphians.

The decline and fall of all these institutions began about six months ago. The Philadelphia University of Medicine and Surgery then recieved a thorough exposure, and its ministerial supporters were disgraced. Still the civil authorities had no evidence by which they could convict them, and had no money with which to procure evidence and institute proceedings. Meanwhile, Dr. Buchanan, with his colleges, was still selling his diplomas, and evading all attempts to capture him. A plan was, however, at last arranged by the editor of the *Record*, for entrapping the wily President. Applications under assumed names, for diplomas, were sent to him from two distant country towns. After some negotiations the diplomas were forwarded, the money for them paid; and receipts given. Further evidence of sale of diplomas was obtained from other persons, and also by personal investigatian of the collegiate building. On the 9th instant Buchanan was arrested for using the mails to defraud, thus violating the laws of the United States; he was held in $10,000 bonds. On the next day a new indictment was brought against him for violating the State law in selling diplomas. This law, enacted in 1870, makes it a misdemeanor for any institution authorized to confer degrees, to sell such degrees, the penalty being $500 fine, and imprisonment not exceeding six months. Under this charge Buchanan was held in further bonds of $2,000. Finally, upon the evidence of some of his associate professors, who testified that he had forged their names, he was held in bonds of $1,000 for the crime of forgery.

On June 14th legal proceedings were begun in the Court of Common Pleas, for judgment of ouster against the trustees and officers of the Philadelphia University of Medicine and Surgery. The attempt will be made to show that, for five years past, this University has exercised powers which it had no right to assume; and that this exercise of power has been of injury to the commonwealth. There are, we believe, some nice legal points in this case, but that the decision will eventually be against the University there can scarcely be a doubt. A similar process will be, or has already been, instituted against the Eclectic Medical College.

The cords of the law are now being tightly drawn around the bogus medical colleges. If there is anything left of them after the law is done, the force of an aroused public sentiment may be relied on to complete the work. Diploma-selling is stopped for the present, and Philadelphia's reputation as a medical center may cease to have its shady side. But we cannot feel sure that the cure is yet a permanent one. The fact that diplomas can be bought, and that diploma-selling is a paying business, has been widely advertised and will become known to the not over-scrupulous, as well as to those who are honest. Permanent protection, though so urgently needed, is not yet insured. It cannot be obtained more surely than by the enactment of a wise law regulating the practice of medicine. With such a law with civil authorities alert and medical organizations not wholly devoted to secret discussions and punctilious care in their reporting, Philadelphia may be able to purify its reputation and attain a scientific eminence which, if not supreme, will at least not be questionable.—*N. Y. Medical Record.*

ARTICLE V.

The Administration of Chloroform.

BY RICHARD L. MACDONNELL, B. A., M. D.

I present the history of an almost fatal case of Chloroform Poisoning, and to venture to make a few remarks on the use of that anæsthetic in Minor Surgery. I do so, not with the idea that any of you will directly gain instruction thereby, but in the hope that some members of this Society, whose experience in the use of anæsthetics will help to throw some light upon a still unsettled question, will instruct the junior members by telling them of the results of their practice, whether they be confirmatory or otherwise of the statements I am about to make.

To begin with, I shall ask you to listen to the history of this case, which I think is one of unusual interest—a case in which, in my own practice, the careful administration of chloroform nearly caused the death of a child.

On the 27th January, 1880, I was to circumcise a boy aged two years and seven months. He was a very healthy child, one of a very healthy family. I have had them all under my care for the last three years. The boy, though he had suffered much pain and inconvenience from the long tight prepuce, was apparently in excellent condition. A few minutes before the operation, I sent to the Medical Hall for one ounce of chloroform, in order that I might be certain that I was using a fresh and reliable material. I made the inhaler myself of a towel. The aperture at the top of the cone was unusually wide. The patient was placed supine at the end of a horizontal operating chair. All his clothes were removed, except flannel shirt. Dr. Sheperd placed twenty minims (by measure) of chloroform on the inhaler. The boy scarcely cried or struggled at all, inhaled freely, and went under the influence of the anæsthetic almost immediately. At the time I thought that he went under too quickly, and I noticed that he was very pale, and that his eyes were upturned. The clamp was applied to the prepuce, and the knife was half way through it, when the boy came to and struggled very violently. Ten minims (by measure) were then added to the towel, and the child again fell asleep, quite suddenly, the pallor and upturning of the eyes being again noticeable. On completing the section of the prepuce and slitting up the mucous membrane, I noticed that the hæmorrhage was very slight. Without further warning, respiration suddenly ceased, and the pulse became imperceptible. There was deadly pallor. Dr. Sheperd immediately inverted the child, and artificial respiration was put into practice. For a time, which of course seemed to me to be hours, but which was, I believe, nearly ten minutes, there was not the slightest response to our efforts. The time passed must have been considerable, for I had time to go out of the room and draw water in the pantry, and afterwards to go out to the back of the house to get snow to throw upon the child's body. I had also to hunt amongst my instruments, to find a forceps to hold up the tongue. At length the application of cold water caused the child to make one little gasp; a second and a third soon followed, and we desisted from our labours with a very hearty sigh of relief. The operation was continued; the child received no more chloroform, but remained asleep for some time time after the last stitch had been put in. For the next forty-eight hours, the child slept almost incessantly.

I do not think that any one can say that the unpleasant event was due to any neglect of necessary precautions. The chloroform was measured, not dropped, and the quantity was noted. The makers were Duncan & Flockhart.

Very few cases of recovery are recorded, after the well-known pallor and cessation of respiration have occurred.

The American Practitioner (Feb. 5th, 1875) mentions a case in the practice of Dr. Jordan, Birmingham, Alabama, much resembling this case of mine. The patient, aged eighteen, a girl, had chloroform given to her for tooth extraction. "After four or five inhalations, some spasmodic movements of the face being observed, the napkin was removed, and the patient directed to open her mouth, which she did, when the tooth was extracted without pain." The usual bad symptoms then set in. Inversion was practised, with artificial respiration. In about five minutes there was a faint attempt at breathing, followed, after a long and painful period, by another. As soon as she was put into the horizontal position the breathing again ceased, and the pulse disappeared. Inversion and artificial respiration were again practised, and the patient for the second time revived. Again she was put in a horizontal position, and again she fainted. She finally recovered, after about four hours' careful watching.

I believe it to be the custom of some surgeons to prefer chloroform for minor operations, on account of the facility with which it can be administered, especially, for instance, in tooth drawing. Now, it has been thought that chloroform, in these very operations, is more especially fatal. Any one may see, in the reports of chloroform deaths, the large proportion of deaths during the performance of minor operations. Moreover, some authorities on the subject of anæsthesia think that some particular operations predispose to poisoning. Thus, Dr. Kidd (*Medical Times and Gazette*, Oct. 5, 1861) states that the operations where nearly all the accidents have occurred have been those for removal of toe-nails, dead phalanges, tooth drawing, strabismus, operations on the testis, reduction of dislocations—all more or less connected with tendinous tissue; and to quote Dr. Richardson (*Medical Times and Gazette*, May 28th, 1861,) "I see nothing in operative surgery (except that there seem to have been more deaths from the vapour when it has been used for minor than for major operations) to account for the fatality."

. Seeing, then, that great risk attends the administration of chloroform, and that this risk is increased, rather than diminished, by the smallness of the dose and the trivial nature of the intended operation, is it not our duty to put aside anæsthetics as much as possible, and in cases where they must be used, to have recourse to some safer agent?

In fact, I go as far as the editor of the *Medical Times and Gazette*, who says (July 24th, 1875,) "We never see it given to anæsthesia without anxiety, and we are prepared to maintain that its use in any minor operation is quite unjustifiable."

In one of the earliest collections of fatal cases, that of Dr. Crisp, brought before the Medical Society of London in 1852, there were records of twenty deaths. In four of these the chloroform had been given for tooth extraction, and in two others cases for the purpose of procuring sleep.

In Dr. Snow's fifty fatal cases the following operations were about to be performed: extraction of teeth and evulsion of toe-nails were most numerous, then follow fistula, opening of a sinus, ligature of piles, application of potassa fusa to ulcers of the legs, and of nitric acid to venereal sores and warts, (6 cases,) removal of small tumors of the cheek, removal of necrosed bone.

The Committee of the Medical and Chirurgical Society of London, published a list of one hundred and nine fatal cases. And again one cannot help being struck with the number of fatal cases in minor surgery, where probably a very small amount was administered. Thus, there were, out of the hundred and nine operations, five dislocations, nine removals of tumors, three examinations for injuries, twelve operations on the male genito-urinary organs, six applications of escharotics, six plastic operations, twelve tooth extractions, five removals of toe-nails, two cases where it was given for the relief of neuralgia.

The fatal cases of chloroform inhalation collected by Dr. Samson are one hundred and seven in number. In sixty-two of these the anæsthetic was given for minor causes. Thus:

Minor Causes.—

Relief of Pain—Lead colic, neuralgia, toothache. . .	4
Examination of injuries and diseases	7
Minor Operations—Removal of toe-nails (5;) of testicle (4;) incisions in the perinæum and cauterization (11;) extraction of teeth (8;) fistula (5;) amputation of fingers (4;) of toe; of penis; opening sinus; removing piles; sounding bladder; catheterism; ligature of vessels; phymosis; polypus uteri; circumcision; squint (2;) removal of fœces	51
	62

In a table containing the particulars of one hundred and fifty-six deaths from chloroform, collected by Dr. Laurence Turnbull, Aural Surgeon to the Jefferson Medical College Hospital, in Philadelphia, there are fourteen cases of tooth extraction. The eldest of these cases was forty-three. The majority had no lesion to account for the fatal result. Amongst the other causes in this table for which chloroform had been given, there were of ailments, facial neuralgia, asthma, headache, toothache, sleeplessness, uterine trouble; of operations, extractions of teeth as already mentioned; introduction of catheter, extraction of thorn, amputation of finger and toes, hydrocele, removal of dead bone, dressing of fracture tumors of small size, fissures of anus.

Is chloroform a safe anæsthetic for children? I believe I am not in error in saying that the common belief is that children enjoy an immunity from the dangers of chloroform. "Chloroform seems also perfectly safe in children." This statement I quote from Holmes' *Principles and Practice of Surgery*. Snow, writing in 1858, states: "It is worthy of remark that none of the accidents from chloroform which have been recorded have occurred to young children." I believe the prevalence of this opinion is based on the following considerations:

Deaths from chloroform may be divided into two classes, viz: (1) Those cases where an organic lesion is found to account for death; (2) those in which no such lesion is found. Now, children belong to the latter class, it not being a common thing to find heart-walls fattily degenerated in the young. Again, children are less frequently the subject of operation than are adults. I believe that a healthy child and a healthy adult stand an equal chance of poisoning. Chloroform is very frequently given to the young for very trifling reasons—often to allay fright, to satisfy a timid mother, or to gain for the operator the reputation of being a kind-hearted man, unable to witness the sufferings of a child.

Deaths from chloroform in children are more common than is generally supposed.

A case is mentioned in the *Medical Times and Gazette* (March 7th, 1857,) where chloroform given for a nævus operation proved fatal to a child one year old.

Dr. Turnbull, in his *Anæsthetic Manual*, mentions eighteen fatal cases. The ages were one, two, four and a half, six, and the remainder up to twelve. In one patient, aged twelve a tooth was being extracted; another, aged eight, was having a wound dressed, while the operation under which a third, aged eleven, suffered, was for an "injury of the toe." The *Lancet* reports two deaths in 1867, one at University College Hospital, London, and one at Manchester, in children aged respectively eight and nine years. Both operations were for strabismus.

In the case which I have read before you this evening, the patient received altogether the vapour of only thirty minims. This, for a child of two and a half years of age, struck me as being an unusually small amount to produce such alarming symptoms. Indeed, in all the records of fatal cases I have seen, I cannot find any one where the death appears to have been caused directly by an over dose, or where the prolongation of the operation has brought about the fatal result. Dr. Richardson found that in small animals a very heavy vapour of chloroform caused instant death from direct action on the nervous system, and not from absorption into the blood; and after quoting Dr. Snow's table, showing that nine out of fifty cases died within the minute after the commencement of inhalation, and four of these within a few seconds, he goes on to say (*Medical Times and Gazette*, May 28th, 1870:) "The moral of this point is of deep interest, and has at least two meanings. It tells us that chloroform, being a direct irritant, is, in that sense alone, an objectionable narcotic vapour; and it tells us further that it is a bad practice to commence the inhalation too abruptly, or to force on narcotism rudely against time." It seems, therefore that chloroform kills merely by its presence, and that a person on whom, by idiosyncrasy, chloroform has a bad effect, will die as quickly from a small dose as from a large dose."

I have heard people talk of giving a "whiff of chloroform" just as they would talk of giving a patient a "drop of brandy" or a "sip of tea," and yet this whiff has often caused instantaneous death. Dr. Turnbull's 142nd case, a woman, aged twenty-five, with "uterine trouble," had "a whiff" amounting to a few drops. It is true that this woman was found to have had a fatty heart; but on the other hand, she had taken chloroform on a previous occasion without a bad symptom. Fifteen to twenty drops were fatal to the 21st case. Forty drops caused death to the 156th case. This patient, whose age was thirty-eight, was anæsthetized to facilitate the reduction of a dislocation of the shoulder-joint. The heart had been examined before the operation, and was thought to be in a healthy condition, but the autopsy proved that it was fattily degenerated.

Dr. J. D. Gillespie, of Edinburgh, reports (*Lancet*, January 6th, 1864) that he gave a young lady who was timid about the extraction of a tooth, fifty minims of chloroform in two doses. She died, but there were no lesions to account for the fatal result.

I have noticed that in the great majority of fatal cases bad symptoms set in on the administration of the second dose. My patient ceased breathing on the second administration (the ten-minim dose.) This is probably not so much due to the cumulative effects of the agent itself as to the fact that it is usually given in the struggling stage, which is thought to be the most dangerous period.

At Leicester (*Lancet*, September 3rd, 1876,) half a drachm of chloroform caused the death of a man, aged fifty. To quote the comment of the editor of the *Lancet*, "Died from the administration of a dose of chloroform scarcely larger than that which is constantly given by unskilled administrators for the relief of cough and dyspnœa, and the conditions on which death depended were undiscoverable during life."

In Dr. Snow's sixteenth case the patient, aged twenty-four, died after the inhalation of forty minims in two doses. Such are the results which can be brought about by a "whiff of chloroform."

The length of time during which the bad symptoms are present varies in different cases. In this case of mine it seemed very long; but I think the period during which the child did not breathe must have been somewhere between five and ten minutes. Mr. Jonathan Hutchinson (*British Medical Journal*, March 8th, 1873) writes as follows. "In a case of a girl at Reigate, in whom apparent death occurred during excision of the knee, we had to perform artificial respiration for at least *ten* minutes before any signs of reanimation occurred. In another case at the London Hospital, in an amputation of the thigh, the period during which I thought the patient dead was almost as long."

Mr. Lawson Tait (*The Practitioner*, Febuary, 1876) found the treatment of chloroform poisoning by inversion and artificial respiration successful in the case of a girl, aged 18, on whom he was performing Amussat's operation. He thinks it was "fully five minutes before she resumed respiration independently of assistance."—*Canada Med. and Surg. Journal.*

EDITORIAL, ETC.

What Others Say.—The Medical Journals of the country notice from time to time the doings of the dentists, and make their comments. The *Medical Record* a weekly journal published in New York, writing of the various dental conventions and associations which have been at work lately, says of the Dental Association of the United States, that "it is expected to be the representative body of the American Dentists. It will hold annual meetings in Washington, where its permanent secretary will reside. The Association aims at high scientific work, and will arrange at once to secure governmental recognition to the dental profession, and help from it in studying ethnological peculiarities in their relation to dentistry. The Smithsonian Institute promises aid in this direction."

The passage of the resolution requiring credentials or a diploma as a perquisite to membership, says the *Record*, will, it is thought, give an impulse to dental education. It refers to the opposition encountered in forming the Association, the attitude of the American Dental Association, that it was believed to have had a too local character, etc.; and proceeds to say that "any genuinely scientific work done by the dentists will be of value to the medical profession. If this new association, therefore, secures, as it promises, the performance of such work, its creation will be a matter of congratulation for us."

But the writer goes on to express the opinion that the examination of the reports of the various meetings referred to, "disappoints the hope of finding *any great scientific work* performed." He thinks that the wranglings about the relative values of cohesive and non-cohesive gold, which vexed the souls of the American Dental Association, ought to have been settled long ago. He would hardly have said that if he had been a dentist.

Refering to a paper on anæsthesia, which, he says, "was defined to be a paralyzation of nervous tissue, ' and to the discussions on the action of nitrous oxide, and whether it oxydized or prevented the oxydization of the blood, "*the fact was brought out very strongly that the Association did not know anything about the matter whatever.*" Rather hard, this, on the Association! Does the editor of the *Record* propose to show us the light? We will be glad to learn from him. He quotes Dr. Barrett, as saying "we dentists should be honest. We are not medical men, and are not acknowledged as such by physicians. There is no way by which a student can become a member of the medical profession except through a medical college."

Going on to the New York meetings the editor of the *Record* says he finds even less evidence of work than at Boston. It is worth while to say, with regard to these meetings, that they were, at least the D. U. Association of the United States, merely preliminary and formative. He justly criticises the "parliamentary infelicities," which are the bane of American meetings everywhere. The article concludes as follows:

> "It will probably strike any one who reads the reports of the dental conventions to which we have been referring, that American dentists are sadly deficient, as yet, in scientific as well as in parliamentary knowledge. Their meetings have, however, shown a commendable appreciation of deficiencies and desire for progress. And considerable work was done which will eventually secure scientific and educational advancement in dentistry."

That the dentists "feel their deficiency" is a satisfaction certainly, and if the *Record* has aided in making them more conspicuous by his rather merciless criticisms, may help us. One cannot help feeling however, in reading the report of the American Neurological Association, which held its sixth annual meeting in New York in June last, an abstract of which is published in the same number of the *Record* from which the above is drawn, that *their doctors* differ quite as redically as ours, on subjects one would suppose they ought to be able to settle, or should have settled long ago; and this is true of the discussions in all medical societies, for even on apparently the simplest subjects there is dispute and doubt, darkness and lack of knowledge; though we are willing to concede more than the *Record*, in charging that we, the dentists, know *nothing*, for the M. D.'s in question know at least a little. We will publish in October No. an editorial from the *Medical Record* for June 17th of this year, in which the writer reviews the "position of the dentist," and seems more liberal than after seeing the reports of the Boston and New York meetings of August. Perhaps he expected too much of us. The remark he makes relative to the demand for educated dentists is worthy of thoughtful pondering, for he writes: "It is a fact, however, that the demand for highly educated dentists is not yet great enough to justify more than a small proportion of that profession in getting a medical diploma." It certainly has not been the observation of most of us that those who come from medical colleges to us, *brought with them acquirements, or to us honor*. H.

Advances in Medical Education.—The Medical College of Virginia, at Richmond, and the Medical Department of the University of Virginia at Charlottesville, are instituting a new departure in the course of study, following the example of other schools that recognize the fact that a few short months is insufficient to acquire a medical education. The session of the first named school is extended to *nine months*, and attendance on two full courses of graded lectures required; and in the University of Virginia graded courses will be instituted and also two full courses of lectures of nine months, with an intermediate examination on the elementary branches at the end of the first course.

The medical schools of the country are realizing slowly that not only is a more extended course of study necessary in order to qualify students for graduation, but that in order to develope the student to the best advantage a *graded course of study* is useful. The greater Universities all seem falling into line in this direction, and doubtless it will be forced upon the medical schools at large by that kind of pressure which is indeed the only effective kind—outside pressure; the schools being in the main what the public desire them to be.

It may be too early to hope for something like this in Dental Colleges, as the whole system of teaching in these is new, and in some respects crude, but it may not be amiss to reflect that this is the only way to perfect culture. He would be an unobservant teacher who has not realized over and often how crude is the material which comes to him for manufacture into dentists, and how his efforts have been crippled and thwarted by the lamentable lack of preparation for the more abstruse facts and doctrine he teaches, by the failure of preparation for their reception. Attention untrained, elementary culture neglected, knowledge of basal principles sadly wanting, the teacher feels that his hands are tied, and that his best efforts cannot develope this very raw material into reputable fabrics. A dependence upon the previous training of a preceptor is more than useless, often mischievous, for too often a wrong direction, if any at all, is given to the mind, and errors are to be unlearned; more difficult often than a new teaching. The usefulness to the teacher's mind, of a sort of preparatory department is only too plain, and some diligent minds are already at work in planning how this may be done. It is too early perhaps to say that a definite classification of studies should be made, or the seniors and juniors should be separately lectured to; but it might be well to make it a subject of study on the part of those who have charge of the schools as well as those outside, who aid in shaping public opinion. It has been the fate of the writer within the past few months to meet and question a young man who for several years has been in the office of an intelligent and successful dentist as a student, a youth whose knowledge of practical dentistry was fair, and yet who did not know what was above or below the diaphragm, or in fact that there was such a division of his interior into cavities. It is certainly dull and uphill work to enter on a course of lectures on histology for example, with the knowledge that such material is present before one. Better preparation is essential, and should be sought for.

H.

BIBLIOGRAPHICAL.

Homœopathy: What is it? By A. B. Palmer, A. M., M. D. Professor of Pathology, &c., University of Michigan, Detroit. Geo. S. Davis, Publisher.

In the introduction to this little book of 100 pages, Dr. Palmer states that the greater part of the matter it contains was given in lectures before the Medical Class of the University of Michigan, doubtless in the war that resulted from the introduction of Homœopathy into that school by legislative action. Whether written under such stimulus or not, it is certainly a most searching inquiry into the fallacies and pretentions of the doctrine of Hahnemannic theories and practice. It is hard to see how a stronger case could be made of utter pretension and humbuggery on the part of a profession than is here presented. The arraignment of *similia similibus*, its folly and weakness, is strong; the utter absurdity of decillionth dilutions; the fact that its professed advocates secretly abandon it, while claiming to follow it; the folly of symptomatic treatment of disease, as practiced by the Homœopaths; all this and much more that is interesting, is here presented in a strong and even ludicious light.

It is indeed difficult to believe that Hahnemann really had faith in his own dogmas, although announcing them with such boldness and confidence. But we must remember that he was at one time a believer in Mesmerism, and had at one time charge of an insane asylum. Possibly in this last fact, on the theory that insanity, like measles is catching, may be found the solution of Homœapathp. No other hypothesis, it would seem, could explain the etherealism of the following extract from the "Lesser writings of Hahnemann," in which he is explaining the wonderful results of "shaking" the tinctures. He writes:

"This result, [of potentization] so incomprehensible to the man of figures, goes so far that we must set bounds to the succussion process, in order that the degree of attenuation be not overbalanced by the increased potency of the medicine, and in that way the highest attenuations become too active. If we wish for example to attenuate a drop of the juice of *Sundew* to the thirtieth degree, but shake each of the bottles with twenty or more succussions from a powerful arm, in the hand of which the bottle is held, in that case this medicine, which I have discovered to be the specific remedy for that frightful epidemic, whooping-cough of children, will have become so powerful in the fifteenth attenuation (spiritualized) that a drop of it given in a teaspoonful of water, would endanger the life of such a child; whereas, if each dilution bottle was shaken but *twice* (with two strokes of the arm) and performed in this manner up to the thirtieth attenuation, a sugar globule, the size of a poppy-seed moistened with the last attenuation, cures this terrible disease with this single dose," etc.

Hahnemann it seems was "cute" if "cracked," as his assertion that "wine and alcohol are not *potentized* by their dilutions," proves. He knew better than to fly in the face of drinkers of his day.

Dr. Palmer shows that even in the milk-sugar used as the vehicle of administration of these so-called remedies, there is more lime, potash, soda, etc. than in the tinctures used. These, then, would be as efficient, when these materials were indicated as if unindicated. Of course it is idle to argue with such men, when they assert, as Hahnemann, or rather Crosiero, one of his disciples, that his wife was cured of a violent pleurisy in five hours by only smelling a globule moistened with the thirtieth dilution of something, which it seems retained all its powers for eighteen or twenty years after the moistening although exposed to sun and air. And the quintillionth attenuation of a grain of gold leaf will prevent suicide. That the lack of money does drive many to self-destruction is evident from the daily reports in the newspapers; but that so small a quantity of gold as this, sniffed up the nostrils will prevent all this, is a cheap method of prevention of suicide which should be more generally known; though it may be that some peculiarity in the preparation may be needful. Is the trituration from *a gold filling in a tooth* sufficient? But we cannot follow Dr. Palmer. Suffice it that this book is a most amusing one; not that the Dr. tries especially to make it so, but by the reproduction of the absurdities of the originators and followers of homœopathy. Any one who wishes a good hearty laugh will surely find cause for it here; and any Allopath who wants a conclusive argument to put in the hands of a patient inclined to "little pills," will do well to loan him or her this book. H.

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MONTHLY SUMMARY.

Chancres of the Tonsil and Mouth.—M. Spillman reports, in the *Revue Medicale de l' Est*, two cases remarkable for the difficulty in the diagnosis of one of them, and especially because of the conditions under which contagion took place:

A lady, fifty-nine years of age, placed by her position beyond all the ordinary causes of syphilitic contagion, presented herself for examination, complaining of a slight sore throat dating back more than a fortnight. There were sharp pains felt at the moment of swallowing, and a considerable glandular swelling situated at the angle of the jaw on the right side. Upon examining the throat there was observed upon the tonsil of the same side an ulcer the size of a three-cent piece, superficial, slightly excavated, and covered with a grayish secretion. The mucus membrane around this ulceration was œdematous and formed like a cushion. No other lesion was found in the buccal mucous membrane or in the isthmus of the fauces. The ganglia of the perotid region were voluminous and painful on pressure. No redness of the skin existed, however. With this exception, the patient complained of no trouble in her general health, and seemed to attach but little importance to the disease from which she suffered. Knowing this patient's manner of life, M. Spillman was unable to suspect syphilis, nevertheless at the end of some days a roseola made its appearance, which permitted no doubt as to the existence of syphilis of which the ulcer in the throat was the primitive lesion. The difficult question of the etiology remained. After much research it was learned that the patient, having received into her house a child raised on the bottle, had the habit of often aspirating the instrument to ascertain the temperature of the milk, by means of the rubber mouth-piece. Now, it was learned that the child thus nourished was affected with hereditary syphilis with multiple lesions of the mouth and genital parts.

A second case reported by M. Spillman is not less interesting in relation to the mode of contagion. This concerned an upholster's apprentice, aged thirteen years, who for several days had borne upon the right side and anterior surface of the lower lip a small red patch, the size of a three-cent piece. This patch was indurated at its base, and the ganglia were enlarged; in fact, it was a labial chancre. Nevertheless, it appeared impossible to find the source of infection until it was learned that this child worked with a workman and took his tacks from the same sack with him. Now, upholsters have a habit of putting a small handful of tacks into their mouths, which they make use of in proportion to the requirements of their work, and put the surplus tacks back into the sack. Upon examination, this patient presented numerous mucous patches about the mouth: hence it is more than probable that the child became infected through placing in his mouth tacks impregnated with this man's saliva.—*St. Louis Clinical Record.*

Effects of Smoking on the Heart.—Some years ago M. Decaisne drew attention to the fact that tobacco-smoking often causes an intermittent pulse. Out of eighty-one great smokers examined, twenty-three presented an intermittent pulse, independent of any cardiac lesion. This intermittency disappeared when the habit of smoking was abandoned. He also studid the effects of smoking on children from nine to fifteen years of age, and found that it undoubtedly caused palpitation, intermittent pulse, and chloro-anæmia. The children, furthermore, became dull, lazy, and predisposed to the use of alcoholic drinks. Recently he reported to the *Societe d'hygiene* the results of his observations on the effects of smoking on women. Since 1865 he has met with and observed forty-three female smokers. Most of them suffered from disturbances of menstruation and digestion, and eight presented very marked intermittency of the pulse without any lesion of the heart. He gave detailed accounts of these eight cases, in which all treatment directed against the intermittency proved utterly useless, while the suppression of tobacco was invariably followed by improvement and very often by complete disappearance of the phenomenon.—*Gazette Obstetricale.*

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ARTICLE I.

The Importance of Direct Sunlight in the Operating Room.

BY J. N. FARRAR, M. D., D. D. S., N. Y. CITY.

(Report on Physiology.—Read before the American Dental Association.)

At the last meeting of the American Dental Association, Dr. A. H. Brockway read a paper on the relation of modern mechanical appliances in dentistry to the health of the operator, showing their beneficial influences over the more laborious customs of former times, a phrase of hygenic physiology of prime importance to all who follow our calling.

Not expecting to propound many new truths, I propose to begin where Dr. Brockway left off, and extend the inquiry so far as to cover the ground of location of the dental work room; for this appears to me as important a phase of physiology as some of the more concrete aspects of this subject.

In discussing this question it will be strange if some of my remarks do not meet with strong opposition, for nothing is more difficult to overcome than old traditional beliefs, habits and customs. But what little may be said will be all the more earnest, because of my having had personal experience in the matter of my subject.

The object is to show that the policy of working all day in a north light is not only unhealthy, but that shaded or reflected light is no better for doing fine work than direct sunlight, if it be, indeed so good.

The influence of direct sunlight upon physiological life is one of those deep subjects which, with our present limited information, can only lead us to form conclusions in regard to its value from the sum total of its workings. As with the relation of vision to thought, and thought to brain, we must be satisfied, for the time, by the existence of their outward expression and inward feeling, that these things are facts, and that they are certainly functional expressions of degrees of intensity of physiological actions, which are more or less dependent upon outward forces through food, air and light carried to and digested in the chemical laboratory of the system by motion called exercise. To deny the essentiality of the dynamic potency of this triad of which sunlight is a factor, is to deny the truth of what we see. That occasionally there are to be found north-light dentists who, by their inherited iron constitutions, can withstand this violation of hygenic law, only proves the elasticity of their nature; but, as a rule, if we inquire into such exceptional cases we will find that they are not constant workers, and have frequently "off hours" of out-door exercise.

It will not be advocated here that sunlight in its greatest midsummer intensity, when its heat may be sufficient to change some of the albuminoid substances of the tissues to a apathological condition, is desirable; but I simply wish to show the beneficial influences of moderate intensity of sunlight. Sir David Brewster says, "Sunlight is the very life blood of nature." "Where light is not permitted to enter, the physician will have to go," is the well-known old Italian proverb. The grateful and sweet power of sunlight is not confined to organic bodies, but extends over so-called inorganic matter also.

Leaving the links of theories and hypothesis of the analytical feature of light to the Tyndalls, Lommels, Magnuses and others, to complete the chain from cause to effect, let us survey the conclusions from experience among results as a whole, confining our remarks to the physiological and psychological influences of sunlight in relation to the occupation of dentists, who, as a class, still persist not only in the practice, but apparently in the belief that the northlight is more advantageous to their well being. They argue that because north light is more steady, it must be, as a matter of course best; which is equivalent to saying that the muscles of the iris are not to be depended upon for adjusting the amount of light necessary to proper vision; as if development by the exercise and the education of the visual organs is a myth; as if artificial appliances about the windows are of no use or benefit; and finally, as if sunlight operations are necessarily inferior to those performed in light from the northern sky.

Laying aside the subject of office practice and generalizing our thoughts, probably no question by a body of men like this, would be more readily answered correctly, thus: that the suns rays are of the utmost importance for the maintenance of physical health, beauty, longevity and integrity of the intellect; or that living tissues when confined for a considerable length of time from direct sunlight, will undergo degeneration.

From times of old the sun has been considered as having more or less influence in the regulation of vegetable and animal functions, both in disease and health. Apollo was not only the name of the sun, but he was also considered the god of medicine, and was worshipped as such. The influence of shade is so general and so persistent in its effects upon organic life that although there are some few apparent exceptions, yet it may be laid down as a rule that all people who pursue their calling in places where the sunshine is shut out, suffer more or less in their physical and mental health. It is not necessary to examine into the life of the dungeon convict, or the underground rooms of filth and squallid humanity of "Five Points," (in

New York City,) to be convinced of the baneful influence of a life in shade, yet these aspects may assist in convincing the skeptic. Compare the buoyant, cheerful, spirited, ruddy faces of open air people with the pale, cadaverous, emaciated, sober, depressed countenances of those whose habitations deprive them of the influence of sunshine. Visit the colleries, badly lighted factories, workshops and underground printing establishments. Visit the narrow alleys, confined courts, and garrets of dense cities. Compare the statistics of mortality and conditions of health of hospital patients who live in north rooms, with those who live in rooms where the cheerful sunlight freely enters. It is a well known fact, says Winslow, who quotes largely from Virchow that the effect of isolation from the stimulus of light causes an alteration in healthy blood. The fibrin, albumen, and red corpuscles become diminished in quantity and degenerated in quality, and the per cent. of the watery portion of the blood is increased. In such condition the tissues become soft and flabby, leading to prostration of the vital energies, with a tendency to pathological changes of the tissues, and in this state, also, the body is very susceptible to endemic and epidemic diseases.

Exactly in what manner the sun's rays act upon animal life is not understood in all particulars and details, but, as Dr. Bryson remarks: "why, in a state of perfect repose in sunlight, the blood should acquire a brighter tinge and an increased force of circulation, provokes inquiries, the importance of which the observant physiologist will not fail to appreciate. It is evident that there is a physiological benefit to be derived from a proper degree or sufficiency of direct sun's rays, which is as necessary to the oxygenation and stimulation of the cutaneous circulation, *per se* as the rendering of the atmosphere better fitted and the more exhilarating for the deeper circulation ; for it is a well-known fact, that, deprived of direct sunlight, the blood degenerates, while by it the feeble and anæmic often return to health." Yet how frequently do we see dentists afflicted with tendencies to phthisis pulmonalis, continuing, even persisting in actual worship, as it were, of the old idol, "north light." The life generating, invigorating, sustaining power of the sun's rays is no fanciful hypothesis; it is the law of nature which causes all life to generate to its highest degree, but which if disregarded, often occasions disease, which, though so insidious in nature, as at first to be unnoticeable, yet so terrible in consequences, so disastrous and fatal in results, as to act with as great, if not greater certainty than any of the devastating epidemics which are the dread of mankind.

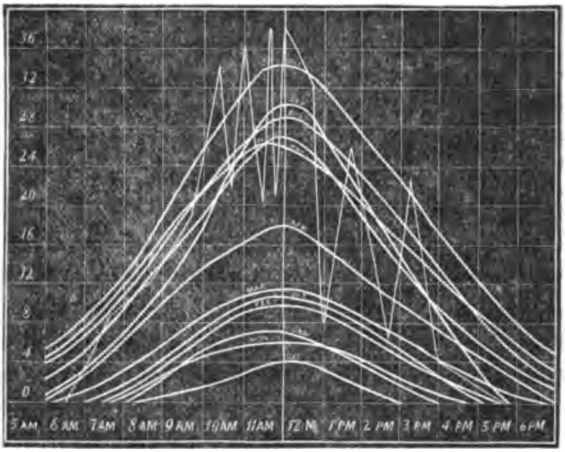
Pure air, so called, free from zymatic contaminations, with proper exercise and rest, the principle theme of countless books, are matters of prime importance to the well being of all. Yet these alone are as palsied factors of the whole triad, without the invigorating influences of the solar rays incorporated into it to supply and keep up the vital energy necessary to the maintenance of the maximum tone of health of the tissues.

Dr. Willard, in his address before the New York Legislature and the State Medical Society said, "We believe that neither pure air nor exercise alone will serve the purpose of keeping the organized machinery of the body in a perfectly healthy condition. Innumerable diseases, it is certain, are produced by the impurity of the one, and the neglect of the other; and it is just as certain that the absence of sunlight will originate disease, or, at least, predispose the system to it of as serious a character as in either of the other cases. If either of these necessities be lacking, the whole machine suffers in a greater or less degree. The triad is inseparable."

That there is some peculiar and necessary virtue in the chemical rays as well as in those of *color* and *heat* would seem to be beyond doubt, and should not be underrated. By suitable media the sun's rays may be separated and the separate influences peculiar to each be ascertained upon vegetable and animallife. We may even subdivide these and obtain a knowledge of their peculiar powers by themselves;* but although for experiment they are instructive, yet to obtain the maximum benefit of the solar light upon life, I think it is now pretty well established, that all the elements of the sun's rays as combined in nature, is best.

The chemist well knows how much the chemical actions of some inorganic bodies are influenced by sunlight, how necessary it is to cause certain elements to unite, and that some crystals will not form while in darkness, while others will crystalize more rapidly on the side of the bottle, facing the sun.

The medical fraternity know that many pharmaceutical preparations exposed to sunlight lose their potency and require to be kept in dark places or in opaque bottles.



A diagram showing the different degrees of intensity of the actinic rays of the sun, at different hours of the day, in different months, by the waving lines; and by the angular lines the rapid fluctuation of these rays during a thunder storm.

The power of the chemical or actinic rays may to some people appear hypothetical, but the Photographer knows very well the power of this element of the sun's light. That the chemical rays differ in intensity in different seasons and in different latitudes: that July light is fully seven times more powerful than the December rays, and differ even during the same day, hour and minute: that the intensity of its power increases as the sun rises in the sky, and decreases as it slides into the western horizon: that thunder storms cause the actinic rays to rapidly fluctuate in intensity, is well known to him.

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* Many curious experiments are recorded by Mr. Hunt in this direction.

He knows well that while a brief moment is sufficient to produce a good photograph in one condition, twenty minutes or more are necessary under other conditions of the sun's rays, and that this difference has but little if any thing to do with the intensity of the bright rays, for under the equatorial sun, especially where light is most intense, photographs are much slower in formation.

All these conditions probably have much to do with energy in people of different climates, and must also have its bearing on their health. California people show by energy and high spirits the influence of this wonderful power of the chemical rays upon them. Probably no community in the United States has so large a per cent. of poor people, and nowhere are people so hopeful, and free from low spirits.

In the vegetable world, the farmer knows that seed will not develope if planted below the germinal influence of the sun's rays, and that plants will not flourish well in the shade, but will be feeble in strength and pale in color.

It is also well known, from experiment that vegetation only absorbs Carbonic Acid, and gives off Oxygen during Sunlight, and that during night the reverse is true to a limited extent. Dr. Hooper says through this agent the decomposition of Carbonic Acid is effected and the plant obtains from the air the carbon it requires out of which its solid structures are for the most part built. The rapidity with which the reduction of the Carbonic Acid takes place depends upon the brilliancy of the light and the amount of Carbon thus obtained upon that condition and the time of exposure conjointly."

Dr. Willard says, "none of the peculiar physiological or chemical influences common to sunlight can be produced by artificial light, unless it be to some doubtful trifling degree by the intensest Drummond light, but there appears to be some evidence of greater influence from electric light, though of fär less value than sunlight."

To see illustrated the demand of vegetable nature for sunlight, go to the forest and see the yearning of the trees for top light; see them seeking it often-times at the expense of leaning many degrees out of the perpendicular. Observe the true and steadfast Sunflower, with its face like the needle to the pole, following most sedulously the sun. Notice the garden pole vines, the beans, the hops as they creep around their staff after his soothing rays, all facing the East at the rising of the "God of Day," and facing the west at His going down. Notice the ivy leaves which, when forced out of their places, will twist upon their stems and face the light again. Go to the farmer's potato-bin, in the back and darker portion of the cellar, late in Spring, and see that beautiful effort to reach the light. See the thousands of silvery vines all shooting parallel and in the direction of the window, and not one of the number so imbecile as not to actually know, as it would seem, the proper and shortest route. I have seen vines from stray potatoes in the dark and dreary rear of the cellar, extended twenty to twenty-five feet along the bottom and up the wall, as if really inspired by the thought to look as it were, out of the window, or some friendly and inviting hole through the underpinning.

Although it is sometimes said that air may be pure without the aid of sunlight, and although so far as relates to freedom from poisonous contaminations of a zymatic nature, or even of any other impurities of an obnoxious character, this assertion may be true, yet the negation of the factor of proper amount of the sun's rays through it, during a large part of the time is an imperfection, which, in so far as it pertains to the well-being of animal health, is to me a sufficient reason for condemning the term.

It is a notable fact, patent to all, that the tables of morality show that those who are constantly exposed to outdoor occupations (even with all the injury resulting from over exercise and hard labor to which so many are subject) enjoy health, and generally live the longest. On the other hand, statistics show that the greatest mortality is among those who live in dark or shady quarters.

Though not exactly relevant to my subject yet it may be interesting, and perhaps, in a measure, support my thesis to regard for a moment the statistics of several eminent French Physicians who examined into the conditions of those who lived in caves and dark mines in France, Belgium and Hungary where it was found that the functions of nutrition is so checked and disturbed, that physical as well as mental growth in children is stunted, and in many cases puberty is either never attained or is greatly retarded. And as a rule, according to Fourcault, those who live a comparatively long life in these deep mines are stunted in stature and intellect.

It is said that the 3000 inhabitants of the Arrondissement of Chimary in Belgium are divided into two classes. Those who act as field laborers are robust and supply their proper quota to the army, while those confined to mining are seldom able to furnish one on account of their physical degeneracy.

Of course the absence of sunlight cannot be the sole cause of all the evils of coal-mining or squalid life. Dampness, contaminated air, over work and poor food all have their influences; but yet, as references to experiments further on will show darkness alone, or rather the want of light will produce all the above mentioned troubles.

According to the United States census for 1850, the total number of deaths in the state of New York was 45 600; 6,691 of which was the result of phthisis pulmonalis, or "consumption," nearly one-seventh of the whole number, and if we include all the scarbutic diseases, one-half.

It is not my aim to attempt to prove that all this mortality is the result of a want of sunlight air, as hereditary, and various other causes are sufficient in some cases to cause it. I wish to show that many, and among them, not a few, are dentists, who have died (and are now dying) with these diseases; who probably might have lived much longer had they lived more in sunshine; and many of those now afflicted may lengthen their days, by a simple and proper use of this God given medicine. Rheumatism, especially neuralgia, is as often the final result of too much shade, as their cure is hastened by the aid of a life in the sun's rays.

That want of proper exercise, both physical and mental, is the cause of much stagnation and rust in the bodily machinery of the human race, is undoubtedly true, yet it is also as true that this degeneration is much more rapid in a life in shade. It is also equally true that any degree of exercise in shade is not as beneficial as when taken in direct sunlight, which is due to a deficiency in a stimulating element supplied to the system by the actual rays of the sun, over and above that which is imparted to the tmosphere in general.

What the exact steps between the cause and effect are which produce this stimulation over and above that from the physiological aspect is not well understood, neither do we know why certain varieties of music stimulate the whole body to forget even fatigue in the "light fantastic step," yet, nevertheless we know music certainly is the cause of stimulation ; so is even the glimpse of sunlight seen through a knothole in a dark room.

By some who have not given this matter attention, it it may be thought with apparent reason that this psychological influence causing and acting through cheerfulness, may be the chief source of benefit from sunlight. Cheerfulness and confidence certainly go far to keep people well, as well as to restore the sick to health; but there is no reason for believing that animal life does not need what the "brainless vegetable" life requires from the sunlight. What physician does not know that close confinement in north rooms leads to nervousness, irritability of disposition, fretfulness, "blues."

John Fiske says, "the effect of sunlight on the optic nerve is to stimulate the medulla and increase thereby the vigor of the circulation and strength of the pulse."

This may account in a measure for this universal tendency towards greater cheerfulness whenever the sun shines.

Florence Nightingale says convalescent people always desire to face the window, and if turned in bed by the nurse, they will persist almost unconsciously in turning their face toward the light again.

Who has not often felt a glow of new life, as it were, when after hours and days of cloudy weather, the sunlight breaks in upon him?

Who has not experienced a happy change of feeling, when passing from a north room, with its dead, staring light, to a south room beaming as sweetly as the promise of friendship or the mellow glance from the eye of love?

In some places in Europe the opinion is current that sunlight is of so capital importance that places are established for the purpose of sunbaths for children who are there exposed naked to the sun's rays as they penetrate ground glass. The ancients understood this when they built their "Solaria," or sun-bath terraces on the tops of their houses. Dr. Longworthy says the influence of the same number of degrees of artificial heat for the same length of time upon the skin, does not produce the same benefit as from the direct rays of the sun."

Much might be said of the similarity in the degree of the health of the highest classes who live in princely curtained palaces, and exercise in their cooped up carriages, and that of the lowest classes who are imprisoned in gloomy work shop, during the day.

Are not dentists so imprisoned, who work from morn till eve in the north light?

Fourcault cites an instance illustrative of the sad and deleterious influence of too much shade in the conditions of a certain Orphan Asylum, where the children were much afflicted with chronic diseases, and where scarbutic affections prevailed, which however, were followed by a very favorable change after the removal of several large mulberry trees from the immediate surroundings.

The amount of sunlight most beneficial to organic life appears however to be on those portions of the earth where day and night are about equal in duration. This would seem to show that darkness has also its uses as well as light.

Every one knows that the repose of night is more refreshing than that of day, and that the reversing of the common order of the hours of exercise and sleep, is contrary to a natural law, which cannot with impunity be violated.

The amount of carbonic acid given off from the lungs has been found (by Drs. Prout and Fyfe) to increase from sunrise until noon, when it reaches its maximum, and then decreases until sundown, when it remains at its minimum through the night. This condition of things is opposite to the theory of the play of the gasses in vegetable life, which causes the night air to be deprived of some of its supplies of oxygen. This, probably, has some essential relation to sleep in the animal department, and all together with the natural quietness of the whole body, and less vigor in the blood circulation, and less oxygenation and waste of molecular tissue is conducive to the harmony of physiological action in the state of sleep which is necessary to prepare the system with a reinforcement of energy from locked up forces in food, &c., obtained during wakeful hours.

To return to my main question—the subject of sunlight like many others of a subtle nature, can better be made clear by relative analysis, by the comparison of extremes: for, by such diverse conditions we are led to feel that these great results can be but the sum total of less and sometimes unsatisfactory evidences, which, when shown in larger quantities, cannot be denied, even by the skeptic. Give a lad a bottle of common air and tell him it has a blue color, and he will deny it;

show him thirty miles of air, and he will say, "who don't know that?"

Probably there is no better evidence on record of the value of sunlight for the maintenance of health than can be shown by the extreme negative arguments given in the experience of Dr. Kane, who during two years in the north, passed two nights of more than two months each in total darkness. For one hundred and twenty-four days at a time, the sun was below the horizon, and one hundred and forty days, or nearly five months before its rays fell again upon the brig.

In an atmosphere free from adulterations of malarious, pestiferous or noxious emanations, with plenty of exercise of the most active character, plenty of time to rest and sleep, with the same quantity of food as was used during the sunlight, they found that with increasing darkness there came increasing disease. Scurvy was more aggravated in type, and the complexion of the healthier as well as the sickly portion of the company became paler and more waxy, the eyes more and more recessed and extremely clear, shortness of breath became general, appetites "ludicrously changed," and at best very slight, and a tendency to mental aberations of an epileptic character, with increase of various other evils. Pains in the joints, rheumatism, coughs, all together causing the "morale" to become effected.

No one was ever more convinced of the importance of sunlight than Dr. Kane as he looked over the pale, ghastly, debilitated condition of his company.

He looked forward with great hope to the rising of the sun, to clear away the horrible vegetating condition of his party. After long and weary waiting for the faint glimmering of day break, he writes. "The day is beginning to glow with the approaching sun. The south at noon has an almost orange tinge. In ten days *his direct rays will reach our hilltops, and, in a week after, he will be dispensing his blessed medicine among our sufferers.* The coming season will open appliances of *morale* help to the sick, and give energy to the hygienic resorts which I am now arranging."

Although unnecessary, a few more quotations from high authority may with interest be given, as corroborating what has been said:

Sir James Wylie, of the imperial Russian Service, remarked to an English physician who was visiting with him the barracks at St. Petersburg, that "three cases of disease occurred on the shaded side, to one on the sunny side; although the apartments on both sides of the building communicated freely with each other, and the discipline and diet and treatment were in every respect the same."

Florence Nightingale says, "second only to fresh air I should be inclined to rank light in importance—not only day light, but direct sunlight is necessary for the speedy recovery of the sick."

Baron Dupuytren, one of the older French surgeons, relates an account of the case of a lady, in Paris, who for several years was afflicted with a great complication of diseases which baffled all her medical advisers: and her case was pronounced hopeless, until he ordered her to be removed from her dark room and sent to another part of the city where she was put into more cheerful quarters; where exposed as much as possible to the sun's rays she rapidly improved, and in time entirely recovered.

It has been shown by experiment that rabbits confined in dark places have tubercle after a few weeks. Cows pent up continually in dark stables become summarily affected.

Sir David Brewster says, "In the years of cholera when this frightful disease reduced the population of some of the principal cities in the world, it was invariably found that the deaths were more numerous in narrow streets and northern exposures, where the salutory beams of light and actinism had seldem shed their influence."

Perhaps no better and more conclusive evidence of the influence of light can be given than that shown by the results of some experiments by Dr. W. F. Edwards, who placed some frogs spawn in a vessel made impervious to light by being covered with dark paper, and another quantity in a box permeable by sunlight, but otherwise under the same circumstances, temperature, etc. Those in the light developed in their regular time and order, but those in the dark did not, though in a few eggs some unmistakable evidences of transformation were noticed. He further placed deep in the "Seine" twelve tadpoles in a tin box pierced with holes sufficient only to permit water to pass; only two underwent the regular development of the frog.

Dr. Hammond, in repeating some of Dr. Edwards experiments, found the same results ; he says : "On one occasion," he "prevented for one hundred and twenty-five days the development of a tadpole by confining it in a vessel to which the rays of light had no access. On placing it in a receptacle open to light, the transformation was at once commenced and was effected in fifteen days." To test the case more conclusively, and to ascertain whether exclusion of surface air had any influence, Edwards placed tadpoles in two large boxes, one open to the air the other covered on the water surface with glass, to prevent them from reaching the surface to get free air. He found the development of the tadpoles in the glass covered box slightly retarded, but was of so short duration that the interference of respiration appeared too slight to produce any effect on the vital development.

To radically show that absence of sunlight is not productive of strength of vision, but is the cause of atrophy of this organ, we have only to notice the Proter fish which live in the subterraneous lakes of Illgra, which have no eyes, (only two little dots,) and also the blindness of fish in the caves of Kentucky and Tyrol.

Now as the claims of northern-light advocates; we find two. First and foremost, they say, north light is steadiest, secondly, that north rooms are cooler ; this second claim can be offset by saying, if the north room is cooler in warm weather, it is correspondingly cooler in cold weather, and neither argument is worth considering.

Dismissing this, let us direct our attention to this steadiness which we hear so much about. In the first place there is no such thing as steady day light, it is only relative; a north light on a bright day, undoubtedly is an excellent light for most operations, but on dark days it is insufficient; and in case of some operations in the posterior part of a deep, dark mouth, even the strongest north light is insufficient, certainly so with me. North-light operators must be content to work in the scale from a minimum to a little above medium degree of intensity of light, while with the aid of the adjustable screens on direct sunlight windows, the operator works in any degree of intensity, from this medium light of cloudy weather to the maximum of the sun's rays. I can do much finer operations and with much less fatigue to my eyes by the south light when I can get the direct rays to fall on the point of my work, than by any other light.

While passing Waltham watch factory one bright morning, I was struck with the cheerfulness of many of the operators, both men and girls, who appeared to be ruddy and very healthy. I afterwards was led to correspond with the treasurer of the company, Mr. Robbins, relative to the subject under discussion. He informed me that he "believed the south light more wholesome; that though the operators generally prefer the north light on bright days they like a strong light to be directed upon the point of work, whether it comes from north or south." "On the south side, screens and curtains are in common use to effect the general shading, while the full strength of the light is allowed to fall upon the work through openings in them." Although as well done, Mr. Robbins says he "cannot say that better work is done on the north than on the south side."

In reply to similar queries sent to the National Watch Company, at Elgin, Illinois, I was informed that their "buildings are so situated that at sometimes during the day the sunlight enters nearly all the windows; and rooms are narrow with high ceiling, and they never have noticed any difference in the work on account of sunlight." If watchmakers, who work on open tables, can do as fine work in sunlight, is it not more reasonable to believe dental operations in the dark oral cavity can be as well done when illuminated by the direct sun's rays.

In 1873 I had a bay window built on the north side of my office, eleven feet wide and five and a half feet deep, with very large north and west side windows and a skylight five feet square, affording as much light as can well be obtained from the north. Entering this bay in a high degree of health, after a vacation trip twice across the continent, consuming several months and being closely confined to business during the day, (never at night) seldom allowing sunlight to fall upon me, I found myself growing weak and very pale. At the end of the year I had a cough, which not only became in a measure chronic, but was steadily increasing to such an extent that my acquaintances believed I had, or was passing into phthisis pulmonalis. This weakness of the general system and close application in the operative department of our profession, was followed after about a year, by a trouble in the eyes, causing pain in them when closely used in fine work, especially in cloudy weather.

Feeling that my health might be improved, I built another bay window, of the same dimensions and kind, on the south side of the house, with proper shift curtains, so that I could regulate the degree of intensity of the light, to suit the various operations, and always, when possible, permitting the sun's rays to pass through a space between the skylight curtains, so as to shine directly into the patient's mouth (not in the eyes,) and occasionally upon myself, as I moved about, and before six months under the same amount of labor and close confinement, I found my cough had left me, and my complexion had changed from a waxy, cadaverous whiteness, to a vigorous, ruddy robustness, and my vision had become strong and enduring, and to my surprise, I found I could do a finer quality of work than ever before, and with much greater ease. After operating in this south bay window eighteen months, I moved to Brooklyn, where at an ordinary southern window I continued to experience the same benefit, though to a more limited extent. Anyone who has once operated in a large bay, knows how disadvantageous and inferior an ordinary window is to work by.

Finding it necessary to change my business location, I found myself working during several winter months by a west window, where, owing to tall houses near, the sun did not shine into my office for three months; my health again began to fail and my eyes troubled me so that I was obliged to abandon my evening studies for several weeks, n order to save them in proper condition for day work. As spring approached and the sun rose high enough to shine above the opposite houses, my health improved and my eyes became stronger until the spring foliage on the trees before the house cut off my light, when my eyes began to pain me again, when I changed my working place to an east light, the best I could command, which in the morning admitted the sun's rays, and my health and eyes improved again; but no light is as good for me as the southern, and as soon as I can find a suitable house, I shall again work in the south light; for this experience satisfies me of the truth that "where there is sun there is thought, cheerfulness, vigor and strength." A writer once said, "Where is the shady side of deep valleys there is cretinism." "Where are cellars and unsunned sides of narrow streets, there is degeneracy, and weakness." Put the pale withering plant and the human being into sunlight, and if they are not too far gone each will recover health and spirit.

If I could make it convenient for patients, and I could have just what I want, I would have my operating room in the top of some part of my house in the form of a skylight observatory, with windows all around, where with suitable curtains and shades, and a chair in the centre, I would always, when possible, face my patient so as to get the direct sun's rays upon the point of my work. Probably a more practical arrangement would be a very prominent bay window projected from the south-west corner of a block of buildings, so planned as to permit the sunlight to shine into it from morning until evening.

ARTICLE II.

General Care of the Mouth for Patients under Twenty Years of Age.

BY DR L. C. TAYLOR, OF HARTFORD, CONN.

When I first received the invitation from your committee to read a paper before this assembly, I was inclined to reply in the negative, but the more I thought of it the more I thought this subject ought to be pressed in the Society, and the experience of elder members drawn out by discussion.

When I first commenced the practic of dentistry, I had very little idea of the causes of decay, and much less of the general diseases of the mouth. I had often heard them spoken of, but gained no knowledge more than that decay was present in nearly every mouth, and the teeth ought to be filled. I was then very sanguine that, if they would only have me fill their teeth, they were safe for the rest of their natural life. To be sure I was honest in my belief, and in all cases tried to perform operations faithfully.

I very soon found that operations performed in advanced life were far more durable than those performed for younger people. I filled teeth, every cavity I could find, and, like many others, recommended the preservation of all six-year molars if they were not so far gone that I could not fill them; and, even then, was so strong in my belief of saving teeth, that I would fill one or three, when the others were lost from an imperative necessity. The age of the patient made very little difference. God had designed that we have thirty-two teeth, and surely the All-Wise had made no mistake. If we violate nature's laws, and fail to develope to the full stature as designed, the fault is not His, but ours. Every tooth that showed signs of decay presented a sufficient reason for a filling.

Of course, the question very naturally came to my mind, What was the cause of such immediate failures in young patients? I am convinced that continued disease of the soft parts has much to do with the tendency to decay; in fact, a very large percentage of the decays now existing in the mouths of the human family are directly traceable to the fevered condition of the soft parts.

If it were not so, why should we find the mouths of so many of our patients nearly or quite healthy on one side, and on the other from ten to fifteen cavities. If we will study such cases, we will very soon find our text; yea, we shall find a whole chapter.

We will invariably find, where a case is like the one referred to, that the patient has lost, while young, a tooth on the side where the greatest degree of health exists. Gentlemen, I am a believer in the thinning-out process for very many of our younger patients, especially those under sixteen. We are told by some eminent authority that the thinning-out process may do for the gardener when he is raising his carrots and beets, but in no instance is it advisable in the general care of the mouth.

I have been asked if I believed in thinning out the mouths of all patients. I answer, no. If nothing need be done, do nothing; but it is my firm belief that twenty-eight good teeth are far better than thirty-two poor, patched up ones. As I have alluded to the six-year molars, the impression may be drawn that I adopt the extraction of these teeth, without regard to their quality, or the age of the patient. Generally, the necessity for thinning out may be anticipated before twelve-year molars are erupted; but never until the second bicuspids have all made their appearance, as they may turn a quarter around if the lateral force is relieved so as to allow the cusps of the new teeth to turn on the roots of the deciduous ones.

When the patient has been neglected until the teeth have all made their appearance (wisdom teeth excepted,) the quality of the various teeth should determine what to extract, extraction always being done systematically, relieving both sides of the mouth so as not to drive the mesial line to the right or left.

If the dentist has the good of his patient at heart, he had better thin out the teeth for one-half of his city patients, and one-third of those from the country.

Our city children are not usually as strong as those reared out of the city. The mental strain upon the system is not as great on the scholar who is in school only twenty-four weeks in the year as on one who is in forty. Our country children, who are reared in the open air, directly under the beautiful sky of heaven, with the sun shining upon them, will be far more vigorous, both physically and mentally, than if enclosed in one of our crowded city schools. Circumstances ought to be considered before we form our opinions.

The ancestry of each and every patient, where there is a shadow of a doubt as to the best course to pursue, should be considered, which may aid to a great extent in determining how far nature is going to help us. If the father be large in his osseous stature, and the mother the reverse, with a somewhat V-shaped arch, we may expect but little, especially if such is the general make up of the preceding generations; but if the reverse be presented, then we may look for some improvement as the patient advances in life.

Irregularities should always be considered, for no patient wants to develope into manhood or womanhood with distorted and unsightly features. Cases are very rare where there is any necessity for badly-deformed features, unless it arises from some other cause than the teeth. Very little assistance need be rendered the masses if that little be given at just the right time. In order to do this, it is necessary that the dentist be well versed in the development of the dental organs. He should also be well acquainted with the law of forces, for when force is applied to the teeth it is sure to have its effect, and if the force be applied in the wrong direction, the results are sure to be bad. Whenever the teeth are badly irregular, we are very apt to consider them badly crowded, and a necessity for relief is very apparent to almost every one.

We have briefly referred to irregularities as one of the causes for extraction. I wish now to make allusion to some of the worst crowded mouths we have to deal with. The teeth in these mouths are not irregular, but even, and often beautiful.

The amount of force that is applied in the developement of the twelve-year molars and wisdom teeth is enormous, and is very likely to pass unnoticed by very many of our so-called first-class practitioners. When a dentist claims that the teeth have a right to be crowded, as long as they are regular, I fear he is overlooking some very important feature in the case, which, if allowed to develope, will be conducive of a great amount of suffering. If the gums are allowed to remain in such a fevered condition as they most likely will assume from the crowded state of the teeth, tartar will be very prevalent; also, the green coating, called by some of our best authorities fungus. Some consider the coating an indication of acidity of the stomach, but it is more probable that it is a fungus, induced by a slightly unhealthy secrétion emitting from the gums. That such is a fact is proved by faithfully removing the coating, and restoring the gums to perfect health by giving the teeth relief. Whenever the coating is removed, and the teeth all retained, we very soon find it gradually returning in mouths of patients who use great care.

There is not an intelligent man in this audience who will not admit that tartar is one of the worst enemies we have to deal with. Of late years we have heard a great deal about diseased gums. Without doubt, a very large percentage of diseased gums is traceable to tartar. Tartar usually gets its first hold in quite young patients, owing to the fever produced in the surrounding parts by the eruption of those teeth which make their appearance later in life.

During the changes of the whole dentition, it is of great importance that we insist upon thorough cleanliness. No patient under twenty ought to allow more than six months, or one year at the longest, to pass without visiting his dentist and having his teeth thoroughly cleaned. I do not mean five or ten minutes with the stick and pumice is sufficient, or even less time with the rubber disk, which is so commonly used by our modern machine dentists. I mean that we should use such instruments as will best remove all accumulations of tartar, and break up the coating so generally found. The coating should be removed to the extreme edge, quite often extending under the gums a short distance. The best evidence that we have thoroughly accomplished our purpose will be the perfect health of the gums, which will assume a pink color, instead of the angry red, on the margin.

If we see striated streaks in the gums, either inside or outside, we may know that tartar is present in the form of a little nodule, which can be dislodged very easily. If allowed to remain, it will induce other deposits, until inflammation absorbs away the principal portion of the process, and the teeth become loosened, as we so often find in the mouths of patients in middle life and advanced age.

Modern dentistry aims to ward off these pending troubles. To do this, we must be thoroughly conversant with nature, and be able to diagnose the incipient stages, as that is the time we can do the greatest amount of good.

One eminent English author has been recorded as saying that diseased gums were seldom found in the mouths of patients under thirty years of age. We should consider it very absurd should any one make the remark that cavities were seldom present where the patient was under twenty, yet it is no more absurd than the remark referred to.

The slightest mechanical or chemical irritation producing any change from the normal color may be considered an indication of diseased gums, and should receive such treatment as to remove the cause, and the effects will take care of themselves. There is not an intelligent mind in this community who would not scout the idea of a surgeon's prescribing iodine, tincture of myrrh, or any other therapeutic remedy, for a sore on the hand, caused simply by the lodgment of a sliver. Many, who are considered good practitioners, are doing precisely the same thing every day by making this kind of application to the gums, when nothing is needed more than in the case of the surgeon. Remove the sliver, and the wound very soon heals. Remove the tartar, and nature will perfect a cure, unless there has been a wasting of the osseous parts which nature will be able to restore.

The point I wish to make here is the importance of diagnosing all diseases in their incipient stages, and treating them then. The importance of looking after the health of the mouth is equally as great as filling cavities. It is said that "an ounce of prevention is worth a pound of cure." The same is true in this case ; if we maintain perfect health, there will be little or no decay.

My own observation has proved that, in some localities where exostosis is prevalent, crowded teeth and inflamed tissues are especially favorable to this much-dreaded disease. When an osseous tumor is well formed, there seems to be no cure except in extracting the offending member. Neuralgia of the face and head are very often the fruits of such disease. Exostosis is a disease not generally recognized by the profession until the tooth has been removed, and the disease exposed to the eye. I was once considerably surprised when an elderly practitioner informed me that there was well-defined exostosis in the mouth of a certain patient.

He then called attention to the peculiar red margin of the gums, at the same time remarking that the majority of dentists would say that diseased gum, in its early stages, was caused by tartar. After questioning the patient, we found she was at times an intense sufferer from neuralgia, which was one of the proofs of a correct prognosis. The four sec-second bicuspids were removed, and all of them showed well-defined exostosis. Since the removal of these teeth, the patient informs me she has never been troubled with neuralgia. It is not at all reasonable to suppose that there are no other teeth in the mouth referred to that are not affected. The relief of the lateral forces has effected a cure for the present, but that it never will trouble her again is more than any one can affirm with any degree of certainty. If that mouth had been thinned out before a sufficient amount of inflamation had been produced to invite hypertrophy of the cementum, there is no doubt the cure would have been permanent, as the disease would never have developed beyond a slight inflammation.

To be successful in conducting our young patients over what is called the critical age, requires strict integrity and a well-grounded knowledge of what will be the results of general symptoms. We are too often inclined to delay taking decisive measures until the time has passed for doing the greatest amount of good to the patient. Sometimes it is very difficult to determine just what we had better do; at other times, perhaps, we are influenced by the reluctance of the little patient, who shrinks from submitting to that which will do the greatest amount of good. If we first gain the confidence of our young patients, and then be very careful never to deceive them in the least degree, we shall soon find them to be far better patients than those in more advanced life. A thorough explanation of the reasons why we do this and that, will be a source of education to the little one, that will mature with the child, and inspire a confidence that will retain our patient's future patronage.—*Trans. Conn. Valley D. S.*

ARTICLE III.

Bromide of Ethyl.

The following paragraphs from Medical Journals, and reports of hospitals, etc., give evidence of the value of this candidate for place among the anæsthetics in use:

"Dr. Lawrence Wolff, of Philadelphia, has recently published a paper on bromide of ethyl as an anæsthetic, which, in view of the recent discussions as to its properties, possesses more than an ordinary degree of interest. In describing the manner of preparing the drug, mention is made of a brown acrid liquid remaining after the bromide is distilled off, and which possesses an unpleasant and pungent odor. Twenty drops of this latter liquid was administered to a rabbit, causing symptoms of irritation of the gastro-intestinal tract, and death in eighteen hours. At the post-mortem, the brain was found to be congested, the abdominal viscera were also congested and irritated, and the odor of the liquid was given off. On the other hand, 30 grains of the pure bromide of ethyl had been given to the same animal, previous to this, and no unpleasant symptoms were produced. Several experiments were made with similar results. In one instance in which the rabbit died while under the influence of the pure bromide of ethyl, the brain was found to be in an anæmic condition, and the odor of the ethyl could not be detected in the organs. W. is inclined to believe that death in Dr. Sims's case was due to the presence of the heavy distillate above mentioned; in support of this view he says that, ethyl bromide being a volatile substance, its odor would not probably be detected forty-one hours after administering it. He does not believe that it is unstable in its composition, as some say, he having failed to separate the bromide from the ethyl, after repeated attempts. The following conclusions are arrived at: rabbits, which are with difficulty anæsthetized, can be ethylized with success and without danger to life. When employed hypodermically the ethyl causes an increase in the number of respirations. No greater toxic effects are produced on the system by its use than would result from the administration of ether or alcohol, so that danger from this source need not be apprehended. Also, that while it cannot be positively stated that pure ethyl bromide is *per se* an absolutely safe anæsthetic, yet it is as safe as ether, and more so than chloroform. He recommends that the drug should have a place in the new pharmacopœia."—*Reprint from American Journal of Pharmacy*, May, 1880.

But a clinical report of Dr. Charles C. F. Gay, of the Buffalo Hospital, says of this article:

"In the case under observation, the new anæsthetic was administered; it required eleven minutes to bring the patient under its influence, and nine drachms were used. Its odor was very disagreeable, its effect was evanescent. Two drachms had previously put the house physician asleep, and during its administration to the patient, the doctor—who appears to be unusually susceptible to the effects of anæsthetics—came near falling asleep.

Another patient, a very strong man, just as he was coming under the influence of the same anæsthetic, became excited, violent, and unmanageable, sprang from the table, and escaped to his bed."

It would seem, however, from the following paragraph that great care should be used in selecting the drug, for "Dr. Carl Jungk, in the *Therapeutic Gazette*, has given the results of analyzing a large number of samples of hydrobromic ether. Among the samples examined were specimens of the ether used by Dr. J. Marion Sims and of that used by Dr. Levis in their fatal cases. The reactions of these demonstrated conclusively their entire unfitness for purposes of inhalation."

The following is an editorial from the *N. Y. Medical Record*, of June 9th, on the subject, has special reference to the experience of French surgeons:

"The properties and value of this new anæsthetic were quite extendedly discussed at a recent meeting of the Paris Surgical Society. Half a dozen gentlemen related their experience, which, on the whole, gave a qualified endorsement of the drug. The same characteristics, good and bad, which have already been noted by American surgeons, were observed by the French, No fatal cases were reported however.

M. Verneuil was struck with the rapid and powerful action of the anæsthetic. One of his patients, a woman, to whom he gave it, was put to sleep almost in an instant. M. Berger was also impressed with its power; a rabbit put under a bell-glass, in which were placed ten grammes (ʒ iiss.) of bromide of ethyl, expired at once. He had never seen so rapid an action in the case of chloroform or ether. These illustrations may be remembered in connection with the general fact, asserted by Dr. Turnbull, that the danger of an anæsthetic is in proportion to its strength of action. We may state here also the fact that a death is reported to have recently occurred in the practice of Dr. Levis while using the bromide. We are not informed, however, that the anæsthetic was the direct or sole cause of the death.

The opinion was expressed, during the discussion referred to, that the bromide of ethyl did not easily produce complete muscular relaxation, and could not be used in operations where such a condition is essential. The opinions, as we have said, while not against its use, were by no means strongly in its favor. This refers to the ether when inhaled. As a local anæsthetic it was spoken of highly. It is the only anæsthetic of this kind which, owing to its non-inflammability, can be safely used in connection with the actual cautery; such was the opinion of M. Micaise. Evidence of its value in this direction has been given by American surgeons, and the point was referred to by Dr. Turnbull, at the recent meeting of the American Medical Association.

It seems that bromide of ethyl is rapidly finding its true place as an anæsthetic, and that place is not a very high one."

ARTICLE IV.

Articulating Artificial Teeth.

BY W. E. DRISCOLL.

(Read before the Indiana State Dental Society.)

Mr. President:—I wish to call attention to a plan for retaining artificial teeth in position where the gums are short. The same idea may have been given the profession before, but I have never seen anything of it in our literature, or heard a word from any one on the subject. If any one has ever heard the plan proposed before, I will be glad if he will communicate the fact to me. I was led to adopt the plan by having observed that a large proportion of bad fits were caused by the upper teeth being pressed outward by some fault in their construction. Hence, any arrangement that would press an upper set backward and a lower set forward, I reasoned, would be a great assistance in their retention in position. Where the inferior natural bicuspids are retained, and it is a full upper set that is to be made, the backward pressure may be secured by allowing an artificial bicuspid or molar to project obliquely behind the last natural tooth on each side, in such a manner as to cause a glancing stroke against the projecting anterior surface of the artificial bicuspid or molar that will press it back at every closure of the jaws.

Where there are no natural bicuspids or first molars, this backward pressure of an upper set must be secured by sinking the inferior molars as low on the gums as can possibly be done even with teeth constructed short from the pins to the grinding surfaces. From the posterior molar forward the ascent on the grinding surfaces must be as great as the superior bicuspids will permit, when they also are short from the pins to their grinding surfaces and are set as far upward as possible. The cuspids and incisors are to be set so that the upper and lower ones will not strike each other as hereafter described, but *may* be made to show in their proper proportions even though there may be necessity for the superior cuspids to be considerably longer than the bicuspids posterior to them. Of course this contemplates making the superior molars exceedingly long in cases where there is a great deal of space between the gums. Still it is the proper thing to do even if the grinding surfaces of the superior molars were one inch from the upper gum and the grinding surfaces of the inferior molars were no more than one-eighth of an inch from the lower gum.

When a new set of teeth are first inserted, the molars should come firmly together, but no teeth anterior to them should be able to catch and hold a strip of muslin when the jaws are closed as firmly as possible.

When the bite is taken, if the operator will place a finger on the middle of each masseter muscle and direct the patient to close the jaws like he would if aiming to crush something in that part of the mouth on both sides at once, the patient will then as a rule close the lower jaw about one-eighth of an inch back of the position that will generally be occupied by it in relation to the superior maxilla.

This being true, and the only way I know of, in which we can depend upon the bite given by the patient, we must in setting up the teeth, make allowance for a shifting of the lower jaw forward at least one-eighth of an inch. If we do not, and the superior incisors lap closely in front of the inferior incisors then the upper plate will be pushed forward at every closure of the jaws, which is the result I am particularly aiming to show a way to avoid.

When all or nearly all the inferior natural teeth are retained, we sometimes find the second or third inferior molars very much elevated above a plane with the bicuspids and incisors. So much so, in some cases that the molars if they strike hard against a full upper set, have the effect of pressing the upper set forward and a bad fit is the consequence, although the upper gums may be first-class for retaining a plate. When this is the case the only teeth that must be allowed to approach closely enough to hold a strip of muslin, are the bicuspids, or if there is a molar that is not elevated above a level with the bicuspids then it may also be allowed to come in firm contact with the upper teeth.

The portion of the plate that extends back of teeth on it, may be allowed to rest upon the apex of the last inferior molar in such a way as to not receive any forward propulsion and still assist in balancing a plate in a difficult case. Quite often this will keep a plate from dropping down when nothing else will secure it near so well. It is a good plan to allow the imprint of the last molar to remain in the wax plate until the case is placed in the mouth, and when necessary the plate may be thickened somewhat to meet the tooth it is to rest upon.

A large proportion of the full sets of artificial teeth, we see, have the upper anterior teeth extending downward so much that we detect their artificial character at a glance. It would seem that many in the business of making artificial teeth, have not noticed that this may in a great measure be overcome by the proper selection of the teeth, that is using those very short from the pins to the cutting edges of the teeth. I mention this in this connection as it is often necessary to use such teeth to give them the necessary "dip" from the anterior to the posterior tooth.

I wish to say in conclusion, that I realize that it is not an easy matter to find anything that will be entirely new to every one who may hear this description. If we abstained from contributing our mites to the general fund of information, from a fear of some one thinking he could have told it better, then our progress will be slow indeed. I also recognize the fact, that it will be difficult for many to understand exactly what I am aiming to explain in all parts of this paper, but I hope all will get a general working idea, and if they do, and put the suggestions to the test of practice, I would like to hear from each one what he thinks of the plan, as well as any suggestion for improvements upon it that may be worked out by them.—*Dental Register.*

ARTICLE V.

The Diseases of Wild Animals.

BY PROFESSOR JEAN VILIAN.

Some naturalists have asserted that wild animals, when in a state ef liberty, are almost entirely free from disease, and that the latter afflicts them only when in captivity. I know that this is entirely erroneous, and it can be proved that captive wild animals are more exempt from ailments than those roaming at large.

While First Surgeon of the Thirty-first Regiment of the Line, then stationed at Alabera, in Algeria, I dissected the carcasses of about fifty lions. The lungs of twenty of them were affected; one half of them were almost gone, showing that consumption is prevalent among the lions of the Sahara and the Sahel.

At the Jaadin des Plantes, here in Parie, seven lions have died since 1869. All of them were born here. I dissected them, and found that their lungs were entirely healthy. To what was the difference due? They received their food regularly, and were carefully protected from inclement weather, while the lions in Africa had to go without food for days, had to inhale the sandy air of the desert, and were frequently drenched by terrible rains.

There is at the Jardin des Plantes a wolf from the Ardennes. He was caught when about six years old. He was suffering from cough, and at one time we thought he was dying. He hawked and spat, and was always sullen and morose. Often he abstained from food for several days. At last we chloroformed him, and examined his throat.

He was found to be suffering from nasal catarrh in its most aggravated form. Under proper medical treatment he recovered rapidly. Nine wolves born at the Jardin never showed the slightest sign of disease.

M. Jacquemart, the famous Indian hunter, often told me that he had seen tigers spitting blood, which exhausted them so that they could be approached within a few feet with impunity.

All monkeys are very delicate animals. They are not gluttonous; and having so much exercise, they are rarely afflicted with diseases of the bowels. But they have weak lungs, and the reason why so many of the most interesting among them die when brought to Europe is the too sudden change of air, diet and water. There is no more intelligent monkey than the chimpanzee, a truly wonderful animal. While in Berlin I dined at the Zoological Gardens by the side of a pet chimpanzee. He partook of every dish like a human being, put sugar into his teacup, stirred it with the spoon, and drank the beverage with evident relish. But his eyes looked supernaturally bright. I felt his pulse. It was 125. "He will not live long," I said to his keeper.

"Why not?" he asked with a sorrowful mien.

"He is consumptive," I replied.

"Indeed? He often coughs."

The chimpanzee died a month later. His left lung was entirely gone.

Carnivorous animals suffer from digestive disorders only when fed upon poor meat. I dissected three hyenas; two in Paris, one in London. Their bowels presented an entirely healthy appearance, and so did their stomachs. But the reverse was the case of an old Abyssinian hyena belonging to a Greek menagerie-keeper, who had caught the animal himself in Africa. He managed to keep it alive for two years, but told me: "The beast always vomited, and often lay on the ground, moaning piteously. What was the cause?" I dissected the hyena. The stomach was in a terrible condition. It was dotted with the scars of boils.

Dogs are gluttons. Wild dogs are worse. We have at the Jardin one of these able to devour meat enough to gorge a tiger or a lion; but the animal has to pay dearly for its voracity; it is always suffering from aggravated constipation, and will not live long.

Foxes are shrewd about everything, and so they are about their food. What hunter has ever found a fox that died from disease? Zoologists admire the dissected body of a fox because there is never anything unhealthy to be found in its organs. Hence, foxes are long-lived.

Six months ago we received at the Jardin four buffaloes from the North American Plains. Two of them died three days after their arrival. They were found to be suffering from a multiplicity of diseases—dyspepsia, imperfect action of the kidneys, and fatty degeneration of the heart. The other two have been ailing ever since, and yet the young buffalo born at the Zoological Gardens of Cologne is the embodiment of health.

The elephant is one of the most temperate and abstemious of animals. He eats for his size so little food that it is a wonder how he is able to exist upon it. True, he dies in captivity before his time, but not from physical causes. There is no doubt that he is one of the most sensitive of animals. A slight or a disappointment mortifies him deeply. The elephants of South Africa, which are rough animals, when compared with those raised in captivity, die from diarrhœa or constipation, as Le Vaillant has stated. Their tamer brethren are free from disease; and, if they die before their time, they generally do so from the abovementioned causes. Sultan, the pride of the Jardin, the most amiable elephant I ever knew, was unable to survive the death of his companion, the pet dog Jean.—*Popular Science Monthly.*

ARTICLE VI.

Rapid Breathing as a Pain Obtunder.

In 1875 Dr. W. G. A. Bonwill a dentist of Philadelphia, discovered that by causing his patients to breathe rapidly for a few minutes, the sense of pain was often so obtunded that he could extract teeth without causing any discomfort. The matter was, soon after this, taken up by Dr. Addinell Hewson, who made a favorable report of his experience with the method, at the International Medical Congress in 1876. Not much interest was excited, however, and the subject was virtually dropped.

At a recent meeting of the Philadelphia County Medical Society, papers upon rapid breathing, as a means of inducing analgesia, were read by Dr. Benjamine Lee and by Dr. Bonwill. Considerable discussion followed. A perusal of the papers and discussion leads to the conclusion that there may be something of considerable practical value in Dr. Bonwill's discovery. At any rate, as it is a thing which can be easily tried without risk to any one, we give briefly the facts regarding it.

In some cases it is necessary, when rapid breathing is to be undertaken, to have the patient sitting in a chair. The most favorable position for him, however, is that of lying down on the side; and it is generally best to throw a handkerchief over the face, so as to prevent the patient's attention from being distracted. He should then be made to breath at the rate of about one hundred respirations per minute. The direction best given is to "blow out" in rapid puffing expirations. At the end of from two to five minutes, the patient continuing his rapid breathing all the time, teeth may be drawn or incisions made, and there will generally be an entire or partial absence of pain, which will last thirty seconds or more. The sense of touch is not affected, nor is unconsciousness gone. When the breathing is first begun the patient may feel some exhilaration;

following this comes a sensation of fulness in the head or dizziness. The face during this time becomes at first flushed, but later, according to Dr. Hewson, it is pale or even bluish. The heart beats more feebly and somewhat faster than normal. We are told that this phenomenon of analgesia is produced in females more readily than in males, and in those of middle age more easily than in the young or old. Children under ten can rarely be made to breathe properly. In cold, clear air a longer time is required than when it is warm.

Regarding the practical uses of the method, it is claimed that it may supplant ether, chloroform, or nitrous oxide in dentistry, minor surgery, and often in obstetrics. In the latter case it is especially applicable when the forceps are to be used. A case of tracheotomy and one of ischiorectral abscess were related, in which analgesia was successfully produced by rapid breathing. The ordinary anæsthetics, when employed for major operations, can be made more effective by combining with them rapid breathing. According to Drs. Garretson, Hewson and Kite, it takes from one half to three-fourths less of the liquid anæsthetics to produce insensibility when the administration is supplemented by rapid breathing. The after effects are less nauseating and unpleasant.

As regards the possible dangers, it is denied that there can be any. Dr. W. R. D. Blackwood, however, stated that he had tried the method on a somewhat hysterical patient, who kept on breathing rapidly for so long a time that he was somewhat alarmed.

The theories of how the rapid breathing acts in thus obtunding pain are as yet unsatisfactory. Dr. Bonwill and Dr. Hewson, its two especial champions, entirely disagree in their attempts at explanation. Dr. Bonwell assigns three causes: 1st, the division of the will-force caused by the rapid voluntary muscular action; 2d, the specific effect of carbonic acid gas set free from the tissues, caused by the throwing into the lungs five times the normal amount of oxygen; 3rd, hyperæmia, due to the excessive amount of air passing into the lungs and causing a damming up of the blood in the brain. The main point of the theory is that rapid breathing produces a hyperoxidation of the blood, which sets carbonic acid free in the tissues. Dr. Hewson, on the other hand, believes that there is a diminished oxygenation of the blood during rapid-breathing, and that the excess of carbonic acid which results poisons the nerve-centres and causes analgesia.

It is unnecessary to discuss these theories. The one is crude, and neither is sufficient. As far as the method itself is concerned, it seems to be well proved that analgesia to a greater or less extent can be obtained by it. Its practical usefulness is not so well established. A good many failures have occurred, and a large amount of evidence is yet to be obtained in order to show its reliability. The method is simple, however, and there ought not to be any trouble in speedy determining its exact value.—*Med. Record.*

ARTICLE VII.

The Position of the Dentist.

Considerable feeling has been excited in England over the views which the *Lancet* has expressed in regard to the professional position of the dentist. That conservative journal has taken the ground that the dentists, or those who hold, as the bulk of them do, a diploma in dental surgery, are not to be considered in any sense members of the medical profession. Furthermore, it is not permitted them to contribute to the columns of the *Lancet*, because they are professionally inferior. This last prohibition was brought about through an invitation which the editor issued to his readers to furnish information upon the subject of the extraction of teeth and putting them back in the jaw. None but medical men, or dentists who had a medical degree or license, were allowed to contribute to the discussion. It appears that the dentists of England have, of late years, become a body of considerable scientific attainments and prominence. A good many write themselves "surgeons practising dentistry," and are rather above the oldfashioned dissyllable which their fathers used. There has been much effort made to show that dentistry is no longer a mechanical trade, but a branch of medical science, which deserves to rank with other specialties, like ophthalmology or dermatology· Although these efforts to elevate the art deserve every encouragement, it will be acknowledged, we think, by most, that the *Lancet* is right in refusing, as yet, to recognize dentistry as a medical specialty. No class of persons has any right to claim membership in the medical profession, or to presume to form any branch of it, until such persons are doctors of medicine themselves. It is in this respect that dentists differ from oculists and gynecologists, etc. The latter must first get their medical diplomas. If dentists would also first get such a degree, they could justly claim every equality with other members of the profession; and such equality is, indeed, already granted everywhere. It is a fact, however, that the demand for highly educated dentists is not yet great enough to justify more than a small proportion of that profession from getting a medical degree. The degree of dental surgeon which so many do get in this country insures a good educational training and a fair amount of medical knowledge. It is making the dental profession one which is much more respected, and which is doing excellent scientific work. This diploma in dental surgery, however, is not enough to entitle him to the claim of practising a surgical specialty.

The attempt, in England, to elevate the standard of dentist by law has led to a rather curious result, if we may believe the statements of Dr. Archibald H. Jacobs, of Dublin, in the *Medical Press.* He asserts that by this law, recently enacted, 4,806 persons became admitted to the profession of dentistry, of whom only 531 possessed any recognized medical, surgical, or dental qualification. The law gives them the privilege of calling themselves surgeon-dentists, and puts them, officially and legally, on a par with surgeons. Considerable dissatisfaction has naturally been felt.—*Medical Record.*

EDITORIAL, ETC.

The Forty-first Annual Course of Instruction in the Baltimore College of Dental Surgery, began under the most favorable auspices on the 14th of October, 1880. The students in attendance upon the opening lecture of the Course numbered over fifty, more than were ever before present at such an early period in the Annual Session of the College during an existence of over forty years. This number has been considerably increased since the fourteenth inst., and there is every reason to conclude that the class of 1880–81, will be the largest the College has ever known.

The desire to vote at the coming Presidential election has delayed the arrival of quite a number, whose appearance will considerably add to the strength of the present class.

This unprecedented prosperity of their *Alma Mater* will be hailed with pleasure by every Alumnus who feels interested in the welfare of the College.

The opening lecture of the course was delivered on the 14th inst. by Prof. F. J. S. Gorgas, and embraced a history of the causes which so long delayed progress towards attaining a correct insight into the pathology of the teeth, when every other department of medical science was receiving the attention it merited. The extensive range of affiliation which dentistry in its completeness possesses, was commented upon, and the relations to other sciences referred to. The mechanical skill necessary to ensure perfection in the dental art when exercised for a noble purpose was regarded as never degrading, but ennobling; the certainty and success thus attained not being equaled by even medicine, although a much older art.

The necessity for earnest and willing workers in the profession was argued, on the ground that a life of usefulness is sweetened by duty and rewarded by honor.

At the close of the lecture a meeting of the students was held, and a committee appointed, who addressed the following communication to Prof. Gorgas:

BALTIMORE COLLEGE OF DENTAL SURGERY OCT. 14, 1880.

DR. GORGAS,—*Dear Sir*—

At a meeting of the students of the Baltimore College of Dental Surgery it was unanimously and enthusiastically decided that a committee should wait upon you and ask the privilege of publishing in pamphlet form, your lecture delivered before the class this morning, believing the most excellent advice contained therein to be of great service to us in our future career, and desiring always to keep it before us.

We remain very respectfully yours,

EFF. WAGNER, ALA.
President.

W. G. FOSTER, MD.
H. S. PITTS, VA.
B. S. SMITH, JR., MD.
Committee.

Last year the faculty of the Baltimore College adopted the beneficiary system, which enables one deserving young man on the recommendation of his State Dental Association to enter the college on the payment of but half of the tuition fees. During the year six State Dental Associations sent such students, and this year twelve State Dental Associations have conferred this privilege on deserving young men, viz.—New York, Massachusetts, North Carolina, South Carolina, Georgia, New Jersey, Connecticut, Maryland and District of Columbia, Pennsylvania, Lousiana and Alabama.

Four applications for such a scholarship have been received from young men in Virginia, and when they were referred to the President of the Virginia State Dental Association, the answer returned was that this Association had determined to recommend no applicants for the beneficiary system. Why the Virginia Association should adopt such action to the detriment of worthy young men, is beyond our comprehension, especially when all other State Dental Societies approve of the beneficiary system and have shown a willingness to assist in promoting its object.

BIBLIOGRAPHICAL.

Nasal Catarrh.—By Prof. Martin Coomes, M. D. Publishers: Bradly & Gilbert, Louisville, Ky., 1880.

This work, the author announces in the preface, was reluctantly prepared at the request of some friends to meet the requirements of a large class of general practitioners remote from metropolitan cities and from specialism. The requirement has been ably met in the production of a comprehensive treatise which does justice to the subject. Commencing with the anatomy of the naso-pharyngeal organs, the method of examining, and the appliances necessary are fully described, together with local medication, constitutional medication, and the effects of climate. The different phases of affection are clearly and minutely shown, with the causes and treatment, rendering the work an important and useful contribution to medical literature.

Common Mind Troubles and The Secret of a Clear Head.—By J. Mortimer Granville, M. D., M. R. C. S., etc. Edited with additions by an American Physician. Publisher: D. C. Brinton, Philadelphia, 1880.

The author of this work has quite a reputation in London as an investigator of diseases of the mind, and his treatise has reached the twelfth thousand edition. It is written for popular instruction and contains directions for combating mind troubles which are frequently the warnings of insanity. The contents consist of

PART I. Mental Failings—Defects of Memory—Confusions of Thought—Sleeplessness from Thought—Hesitations in Speech —Low Spirits—Good and Bad Tempers—Mental Languor and Listlessness—Morbid Fears—"Creatures of Circumstances."

PART II. Temperature—Habit—Time—Pleasure—Self-Importance—Consistency—Simplicity—The Secret of a Clear Head.

The work is a very useful one and will repay every one for its closest study.

Report of the Health Officers of District of Columbia.—By Smith Townshend, M. D., 1880.

A very interesting and instructive report, exhibiting the management and the results of the Health Department of Washington City, Georgetown, &c.

American Newspaper Directory. 1880. Publishers: Geo. P. Rowell & Co., New York.

This work which reflects credit upon the enterprising publishers, contains accurate lists of all the newspapers and periodicals published in the United States, Territories, and Dominion of Canada, together with a description of the towns and cities where published.

The Skin in Health and Disease.—By L. Duncan Bulkley, M. D. Attending Physician for Skin and Veneral Diseases at N. Y. Hospital, etc. Publisher: Presley Blakiston, Philadelphia, 1880.

This work is another of the series of the American Health Primers, and like its predecessors is a useful and interesting treatise. Its contents consist of the Anatomy and Physiology of the Skin, The Care of the Skin in Health, Diseases of the Skin, Diet and Hygiene in Diseases of the Skin. Much important information can be gleaned from the American Health Primers, as they are all prepared by competent authors.

School and Industrial Hygiene.—By D. F. Lincoln, M. D. Publisher: Presley Blakiston, Philadelphia, 1880.

Another of the American Health Primers to which the phrase *multum in parvo* can be appropriately applied. Parents and teachers are directly interested in this subject and will find a great deal of useful information given in this small treatise. Its contents consist of Articles on Emotional and Mental Strain, Food and Sleep, Bodily Growth, Amount of Study, Exercise, Care of the Eyes, School Desks and Seats, A Model School Room, Ventilation and Heating, Site, Drainage, etc., Private Schools, Colleges, Contagious Diseases, Injurious Effects of Inhaling Dust and Poisonous Substances, Injuries from Atmospheric Changes, Injuries from Over-use of Certain Organs, Injuries from Accidents, Duration of Life in Various Occupations.

MONTHLY SUMMARY.

Watching the Pulse During the Administration of Chloroform.—After many years of experience in giving chloroform, both in private practice and as a hospital surgeon, I view with some apprehension the views lately put forward by some of our correspondents, that there is no need to watch the pulse in giving chloroform, only the respiration. In inhaling it myself I observed that about a minute was occupied between the time of inhalation and the maximum effect being produced, so that if the patient's pulse begins to intermit, that time has to elapse between the time that the chloroform is taken from the mouth, *with the effects of the chloroform still deepening in intensity.* Surely, then, it is of importance to note the very faint beginning of such mischief.

I have never seen a death caused by chloroform, but I have seen a few cases in which it was necessary to stop the operation for a time, on account of the effects of the chloroform, which, in these cases, always acted firstly on the heart. In no case have I seen cessation of the respiration. The experience, however, of death by chloroform in the human subject of any one medical man is necessarily so limited, and the circumstances of such deaths are so little favorable for scientific observation, that I think it is highly dangerous to found a mode of practice on the ideas of one or two, who may be inclined to look on the cessation of respiration as the first danger to be avoided, and the only one to be carefully looked for. Perhaps, in regard to this, I may be allowed to speak from my experiments made on animals in 1875–76.

In these experiments, *inter alia*, I found that in cats, when chloroform was rapidly administered (the best way, in my opinion, as avoiding that saturation of the blood with chloroform which is apt to be produced by slow administration, and which renders stoppage of the heart's action, if it does occur, almost surely fatal) the systolic action of the heart *invariably* ceased before respiration. If the chloroform was then removed at once, it was sometimes easy enough to restore animation, but if the chloroform was continued until the respiration stopped also, the chances of recovery were infinitely reduced, and disappear when auricular action ceases. I found on post-mortem examination and experiment that chloroform invariably stopped the action of the heart when found on it.

Wishing to protect the heart's action against the chloroform, I, after several preliminary experiments, used a large, but not a lethal, dose of atrophine, injected about an hour previously to the administration of the chloroform. I now found that the respiration invariably stopped before the heart's action, stoppage of the latter being exceedingly difficult to produce in one case; indeed, I could not kill the cat, though I gave it chloroform in as strong saturations as I possibly could for thirty-five minutes (two minutes being generally sufficient to kill,) and recovery after stoppage of respiration was generally *spontaneous*, respiration recommencing of itself; but when I pushed the chloroform till all signs of heart movement were stopped, the effects were the same as if no atrophine had been given.

Whatever opinions may be held as to the propriety of continuing the use of chloroform as an anæsthetic, it is still used by many every day, and while it continues to be so, it is of importance that all precautions for using it safely should be taken.

In conclusion, I may say that I should be glad to know that any hospital or other surgeon who still continues to use chloroform often was taking advantage of the hints to be gleaned from my experiments as to the use of atrophine as a heart protector during its administration.—*Dr. Munro in British Med. Journal.*

Use of Chloroform in Diseases of the Heart.—On this subject M. Vergely, of Bordeaux (*La France Medicale,*) remarks that there is a difference of opinion. some asserting chloroform is very useful, and others that it does harm in affections of the heart. In M. Vergely's memoir, to which M. Dieulafoy has recently drawn the attention of the Societe Medicale des Hopitaux, three principal points are established.

1. That the existence of heart disease does not contraindicate the use of anæsthetics.
2. That chloroform is a sedative in this class of diseases.
3. That it should be used with discretion. In some cases of severe palpitation chloroform may be successfully administered. Also in some cases of dyspnœa and palpitation arising from miteal insufficiency, ether alone or conjointly with hypodermic injections of morphia. M. Vergely has also given it without any accident in angina pectoris, and in certain other affections of the heart characterized by dyspnœa and palpitation. From inquiries he has made into the literature of the subject, he concludes that this agent has been employed too timidly and unsystematically.—*Druggists Circular.*

Tragedy in a Dental Office.—On July 26th, at about 5 o'clock, a terrible tragedy occurred in Oakland, California, the persons concerned being E. F. Schroeder, exchange teller in the London and San Francisco Bank, and Dr. Alfred Lefevre, a prominent dentist of Oakland. The latter was shot and killed by Schroeder, who visited him in his office, and fired two shots, one of which entered Dr. Lefevre's left side, ranging downward through the intestines and lodging in the opposite hip. The second shot missed, but the right side of the head and ear were powder-burned.

A San Francisco daily states that Mr. Schroeder has refused to make any statement regarding the affair, and the following particulars have been gathered from persons not directly interested.

According to the reports, it appears that Mrs. Schroeder, who is a daughter of Rev. Horatio Stebbins, of San Francisco, went down to the train on the day of the shooting, to meet her husband on his arrival from San Francisco. She was accompanied by her little daughter, some three years of age. Upon meeting her husband, Mrs. Schroeder is represented to have told him that on the Saturday previous, while under the influence of chloroform in Dr. Lefevre's office, a felonious assault had been made upon her by the dentist in question.

After hearing the story, Schroeder went with his wife and child to Dr. Lefevre's office corner of Eighth street and Broadway, and mounting the stairs, entered the Doctor's office. Advancing within a few feet of Lefevre, he pulled a pistol and fired two shots. One report states that Schroeder said, "Dr. Lefevre, this is my wife; take this," (firing) "and take that" (firing again.) The shooting took place at 4:50 o'clock, and Schroeder was almost immediately arrested. On the way to the City Prison, Schroeder said: "I hope to God I have killed him ; if I haven't I will. A man cannot seduce my wife and live."

Dr. Lefevre, upon being shot, fell on the threshold of the door leading from the operating room to the private working room. He was raised and placed upon a sofa and was soon surrounded by physicians who had been summoned. The wound was fatal, Dr. Lefevre survived about forty minutes.

There are many people who believe that Mrs. Schroeder's charge against the deceased was purely illusory. It is well known that such hallucinations are not uncommon after the administering of chloroform. Some remarkable cases exist where hallucinations of this nature have taken the form of absolute conviction in the minds of the persons laboring under them, although there exists abundant evidence to prove that this conviction was utterly unfounded.

Dr. Lefevre was quite well known in Western New York, having been a student in the office of the late Dr. J. G. Barbor, of Le Roy, and went to California in 1862. We are informed that he was a native of Canada.

The coroner's jury rendered a verdict charging Schroeder with the murder of Dr Lefevre.—*Dent. Ad.*

Apparent Death as a Result of Asphyxia.—Medical journals, says the *Medical Press and Circular*, occasionly informs us of wonderful resuscitations brought about by the persistent use of artificial respiration; but two, lately reported to the Academy of Science, Paris, by Dr. Fort, Professor of Anatomy in the Ecole Pratique, are especially noteworthy, and teach us to persevere in any efforts we may make to bring back signs of life. In the case of a child three years old, who had already been placed in his shroud, Dr. Fort commenced the use of artificial respiration three and a half hours after apparent death. After four and a half hours of steady work the child was brought back to life.. The other case was that of a drowned man, who had been under water for twelve minutes before the body was recovered. Artificial respiration was commenced an hour afterward, and after being kept up for hours the man was restored to life. The report of the meeting of the Academy does not give the details of the child's case before the appearance of the apparent death, nor what prompted the doctor to commence the artificial respiration.—*Med. and Surg. Reporter.*

A New Anæsthetic.—J. T. Clover, in the *British Medical Journal* writes as follows: "In your last number mention is made of a new anæsthetic, described as a combination of nitrous oxide gas and ethylen dichloride, and introduced in Edinburgh by Mr. Macleve.

I have not used the ethylen dichloride, but I suspect that the substance alluded to is ethidene dichloride, and I have been giving this with laughing gas for the last fifteen months to more than a thousand cases in hospital and private practice. On the whole, I think ethidene dichloride a better anæsthetic than ether or chloroform, and can confirm all that Mr. Macleve says of it; but I have found that when given beyond a certain strength it causes vomiting and depression of the heart's action; and I fear that the plan recommended, of pouring it on a sponge in the tube or supplemental bag, without the means of regulating the strength of the vapor, will produce ere long results less satisfactory. It will be found that half a drachm is not always sufficient; and, if a larger quantity be used and it run through into the inhaler, the dose may be made strong enough to produce serious results. Chloroform applied in the same way would answer very well in the majority of cases; but in an exceptional one it would yield the vapor too abundantly for safety.

I have found a small-sized gas and ether inhaler answer my purpose; but I have no doubt the portable regulating ether inhaler, charged with about two-thirds of the usual supply of ether, would do equally well. In all cases of ethidene inhaling, the pulse should be watched as well as the breathing."

Swallowing False Teeth.—English papers report an odd case from Carlisle. A doctor was called one evening at 7 o'clock to visit a lady of about 55, who, as she described it, had been feeling poorly all day, but could give no definite symptoms, and complained of no pain. During the examination he noticed a change in her speech. This led to an investigation of her throat. Outwardly the neck appeared normal, and nothing could be felt to indicate an obstruction; he then examined the pharynx, but no foreign body could be seen there, and the examination only brought on vomiting and straining. However, he determined to look a second time, and judge of his surprise to find embedded low back in the pharynx a set of false teeth, which he extracted with little trouble. Upon inquiry, the woman said she had missed her teeth about 9 o'clock in the morning, but had no idea she had swallowed them. It is remarkable that they had been in the pharynx without causing her pain for ten hours.

Classic Dentistry.—Dr. Xavier Landerer, of Athens, says in the London *Chemist and Druggist*: "It may be safely asserted that the ancients certainly cleaned their teeth and used tooth powder. If the necessary attention was given, relics would be found in the graves of the women. The word *odontotrimma*, the tooth-scouring stuff or tooth powder, is found in ancient Greek, and in the Greek Pharmacopœia is applied to tooth powder. It is interesting to find that the ancients had made some advance in dentistry. A friend of mine (now dead) occupied himself in collecting ancient Hellenic skulls, wishing to show that they did not differ in shape from those now carried in Greece. Among several hundreds of these skulls, some perhaps 2,000 years old, we found two with 'stopped' teeth. One was filled with a mass as hard as stone, which, on analysis, proved to be hydraulic lime, made from volcanic ash, Santorin earth, and lime. Marvellous as it may seem, the hollow of one tooth in the other skull had been filled with gold thread or gold leaf. The metal used was pure. The skull itself, though deprived of the stopping, is now in the Archæological Museum."

Is Salicylic Acid Injurious to the Teeth?—The *Journal of Materia Medica* observes that salicylic acid, now so much in use as a dentifrice, is found, by Dr. Buch, of St. Petersburg, to be a solvent, and exceedingly injurious. Dr. Buch states that he was in the habit of using a solution of three parts in one thousand of salicylic acid, a lotion of such strength being fatal to bacteria; in a few weeks, however, he experienced a singular sensation in his mouth; the teeth appeared to become softer, and on the surface something gritty was detected, there being evidently a grandular formation.

Dr. Buch's conclusion is that the substance in question is a salicylate of lime, and, if so, the use of the acid as a dentifrice should be discontinued.—*Medical and Surgical Reporter.*

The Temperature of the Breath.—A good deal of curiosity is being expressed in regard to the apparent high temperature of the breath, under certain conditions. If we take an ordinary clinical thermometer, wrap it up pretty tightly in several folds of a silk handkerchief, apply it closely to the lips and breathe gently through the silk just over the bulb of the thermometer for about five minutes, always making the inspirations through the nose, we shall find that the thermometer will show a temperature ranging from 101° to 108°, or even 109.5°. Dr. E. S. Clark first called attention to this phenomena in the *Medical Herald*. The facts are corroborated by Dr. Dudgeon in the *Medical Press and Circular*.—*Med. Record.*

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THE AMERICAN JOURNAL OF DENTAL SCIENCE.

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ARTICLE I.

Some Points in the Natural History of Caries of the Teeth, and the Value of Fillings for its Arrest.

BY G. V. BLACK, D. D. S., OF JACKSONVILLE, ILL.

Perhaps the best way to estimate the value of fillings, is to study the results in connection with an extended study of the habits and tendencies of caries of the teeth when allowed to pursue its course. The best results in the study of medicine within the last half century, have been obtained by the close observations made on disease, which has been allowed to pursue its course without therapeutic interference. By this means many errors of opinion respecting the tendency of individual diseases have been corrected, and a better knowledge of them arrived at. Indeed it is now recognized that in order to know a disease well, it must be studied without therapeutic interference—by no other means can we so certainly arrive at its true nature, habits and tendencies. Having thus gained an understanding of the disease, we are ready to note understandingly the modifying influence of drugs—not before—for certainly we cannot be supposed to understand what good or evil a drug has done in changing the course of a disease, if we have no real knowledge of the course of the disease when not modified by drugs.

Each disease has its habits and tendencies, which are more or less fixed, and each case pursues a course very similar to each other case of like nature or type. Each specific disease also arises from a specific cause; always from that one cause, and from no other, as certainly as an oak arises from an acorn, or a bird from an egg. In this catalogue of specific diseases, we, of course, do not include those accidental diseases which run no specific course, and probably arise from causes purely accidental. Yet it is well understood that the progress of discovery is continually transferring important lesions to the list of specific diseases.

Decay of the teeth is certainly a specific disease, running a specific course, and evidently arises from a certain specific cause, but this cause is not as yet certainly known. It may be regarded as a malignant disease, in that its general tendency is to the entire destruction of the organ attacked. This malignancy, however, receives a decided check in the fact that there is absolute immunity for all the other organs of the body than the teeth, hence the disease is always strictly localized. Whether its specific cause be local or general, is not yet certainly known. Not being able to trace the cause, our only knowledge of the disease is its phenomena, and it is to these phenomema that we now wish to direct attention. In this paper we can only glance at a few points. It was no part of the plan of this paper to enter into a discussion of the *cause* of decay, but I may be pardoned for introducing a few propositions on that subject, which will in some measure represent my conception of the facts now known to me.

1. There is no decay without an acid condition of the fluids of the mouth.

2. If acidity alone be the cause of decay it must be due to a state or condition of the acid not yet known or recognized.

3. While an acid is not only always present, but is probably a necessity to the inception and progress of decay, there may be an agent acting in conjunction with the acid that is not yet known or recognized.

4. While there is no decay without the presence of an acid, there is not necessarily decay because of the presence of an acid.

5. Decay is in no wise dependent upon the physiological perfection or imperfection of tooth structure any farther than that imperfections of the surface of a tooth may afford favorable points for the beginnings of decay.

6. The force of vitality has no influence in the prevention of decay. But in living dentine decay progresses less rapidly, probably because the tubules being perfectly filled with the fibrils, tends to prevent the ingress of the materies morbi, and in this manner limits the surface upon which it may exert its influence, and more rapidly in soft teeth than in hard ones, because there is less basic substance to be broken down.

My object in experimenting with acids in motion, of which a partial report was made to the American Dental Association, also to the Mississippi Valley Dental Association, was to see if this change in the condition of the acid would produce a change in its action. My observations had led me to the conclusion that certain changes would be produced. The result of experiments, while they demonstrated a change of action, showed a different change from that anticipated by me before beginning. All my efforts to detect a special agent acting jointly with an acid for the production of decay, have so far entirely failed. I have never been able to satisfy myself, either by experiment, observation, or otherwise, that *Leptothrix Buccalis* or other fungi demonstrable with the microscope acted as such morbific agent, or stood in the relation of causation to decay of the teeth.

We will now leave the causes of decay entirely, and in the rest of this paper we will regard it simply as the result of a force, without reference to the cause or origin of this force.

Decay is disintegration of the tooth substance, molecule by molecule. It always begins on the surface of the tooth and slowly makes its way toward the central parts, spreading as it proceeds. The dentine is destroyed more rapidly than the enamel so that in most instances the dentine is burrowed out beneath the enamel in such manner that the diameter of the cavity just within is larger than the opening.

Decay has pretty definitely fixed habits as to the point upon a tooth that is attacked, and one of the most notable characteristics is that it never attacks a tooth upon a surface that is smooth and is constantly worn or is kept clean by the attrition of mastication, or the friction of the lips, cheeks or tongue. All such points are absolutely exempt from attack.

The points of attack may be divided into four classes:

1. Pits and grooves in the enamel.
2. Approximal surfaces.
3. Points which are from any cause habitually unclean.
4. At the junction of the cementum and enamel.

The *first class* is usually the first to make its appearance. It occurs in the pits and grooves of the enamel wherever found. In the molars, in the pits and grooves of the grinding surface, and in the groove which is often present in the duccal surface. In the bicuspids, in the pits and grooves of the grinding surface. In the incisors, in the pits often present in the lingual surface. In pits and grooves, the result of faulty formation in any of the teeth.

The *second class* occurs in the approximal surfaces of any or all of the teeth below the junction of the cementum with the enamel, and is usually the second to make its appearance.

The *third class* rarely makes its appearance except in uncleanly mouths or among those who habitually sleep with the mouth open. Their position is the smooth surfaces—usually the buccal or labial—of any or all of the teeth below the junction of the cementum with the enamel.

The *fourth class* is always accompanied with diseased gums, which has usually caused more or less exposure of the cementum and has its beginning just at the joining of the cementum and enamel. It is most generally seen in middle life or in old age. Very rarely in children or young persons.

The first two classes belong to youth or early maturity. If they are not seen until later it is on account of their slow progress. After watching this point critically, I have become satisfied that very few decays in these positions originate after the age of twenty-five years; and as these comprise about ninety per cent. of all decay, we may conclude that caries of the teeth, in its inception at least, is a disease of youth.

We wish now to call especial attention to two points. We all know that mouths are frequently met with in which there are many decays, which at middle life have not progressed so far as to do material injury. Many points have been attacked, but the destructive process has been extremely slow. Again we often find dentures in which very few decays have started, but these few have progressed with great rapidity, and several teeth have been lost, while perhaps all, or nearly all, of the remaining ones are free from decay. There are the following variations:

1. Cases in which *few* decays start and the destructive process is *slow.*
2. Cases in which *many* decays start and the destructive process is *slow.*
3. Cases occur where few decays start and the destructive process is rapid.
4. Cases occur where many decays start and the destructive process is rapid.

To represent these characteristics, we propose the terms "vis inita," beginning-power—from *vis*, power, force; and *ineo*, to begin—and "vis deleta," destroying-power—from *deleco*, to blot out, to destroy. With these words representing the quality of the power of caries, we may associate numbers to represent our conception of the degree of that power in a given case.

The following are the extremes of possible combinations:

Vis inita 1, with vis deleta 1 to 100.

Vis inita 100, with vis deleta 1 to 100.

For some years past we have made a special study of some of these characteristics of decay, particularly those of which we now speak, and we are satisfied that a more close and thoughtful study of them will be of very great benefit, both to operator and patient, and at the same time serve to correct many misapprehensions as to the real value of fillings. And we have thought that the selection of some simple words not in common use, which might be clothed with a specific meaning to represent them, would not only be acceptable but helpful.

Now, as to the character of these powers, we do not for a moment wish to be understood as attributing the beginning of decay, the vis inita, and the destructive power, vis deleta, to different causes, but should rather say that these are manifestations of one force, but of different qualities of that force, or manifestations under differences of environment. In the one case the action is on the surface of the tooth, or in a shallow pit or groove, where the general fluids of the mouth have tolerably free access to the part or tissue being acted upon, while the other is much more secluded from disturbing influences—is deeper in the tooth—more hidden away. Again, the vis inita is exerted for the most part upon enamel, while the vis deleta is spent mostly upon the dentine, or with our present lack of knowledge of the cause of decay, it might be regarded as an arbitrary division for the study of phenomena. Whatever may be the cause of the differences, it is clear enough that they exist and modify powerfully the conditions under which we are called upon for dental operations, and exert a great influence upon the value or protective power of fillings.

It is not uncommon to find persons who have had no dental operations whatever, with some teeth missing, or only roots remaining here and there through the mouth. An examination proves that most of the other teeth are free from decay. The teeth that are wanting have been attacked and quickly destroyed by decay, while the remaining ones have not been attacked at all. In this case we would say, perhaps, that there was vis inita, 25; vis deleta, 90.

In another case we may find the denture of a patient at middle life with many small, dark cavities, none of which have progressed so far as to give any trouble. For the practical purposes of mastication the teeth are as yet uninjured. Only a short time ago I examined such a case, in which I should say there was vis inita, 80; vis deleta, 10. Many decays had started in the teeth, but that power which drives on to quick and sure destruction, which we so often see to our sorrow, was wanting.

It was very different with a pair of twins, 18 years old, Swedish girls, who came to me for advice, last October. In the mouths of these girls there was not a tooth, except the wisdom teeth (which were not yet through the gums,) that were not attacked at from one to four points; not a tooth which was not from one-half to three-fourths destroyed by caries; in nearly every tooth there was a living exposed pulp. This, as being the most complete case of destruction I have ever met with, I should place vis inita, 100; vis deleta, 100, as the proper expression of the activity of the force there in operation.

We need not continue the recitation of these cases farther at present, as we think our meaning will be readily understood; but will now turn our attention to the modifying influence of age, or the different expressions of these powers usually found at different periods of life.

Decay of the teeth is essentially a disease of youth. Especially is this the case with the first and second classes of decay—those starting in the pits and grooves and on the approximal surfaces of the teeth, and to a somewhat lesser extent with the third class. With these, the first and second classes, the vis inita is most strongly manifested before the age of twenty years, and grows less and less active after that age; and perhaps ceases altogether as early as the fortieth year, except in occasional cases. As the first two classes include most of the cavities met with, we find that if the decays occurring up to this time are successfully protected by fillings, the work of the dentist is about accomplished.

With the vis deleta the case is very different—this may continue for a much longer period. It is less modified by age. We well remember a case which came under our care fifteen years ago. We all remember such cases. The patient was a maiden lady, twenty-eight years old. The vis inita had been very strong as was evident from the fact that almost every tooth remaining in the mouth—five had been lost—had been attacked at from one to three points, except the lower incisors. The vis deleta was less strong, say fifty, but by this time had made sad havoc, as the previous attempts at filling had not been very effectual. The patient wished to have the teeth out and try artificial ones. We protested and made fillings instead. Since that time no new cavity has occurred. Eight years afterwards she was married and has borne one child. During this pregnancy two of the cavities, the fillings in which had been observed to be slightly leaky at the margins, flamed out into rapid decay (vis deleta, strong.) These points were attended to and no decay has occurred to this day. (These were not plastic fillings.) In this case the vis inita had become almost or quite nothing, with possibly a diminishing of the destructive force, and the remaining vis deleta was mastered by reasonably good fillings until an increase of this force, during pregnancy, searched out and exposed the weak points. Three younger sisters of this patient came under my care at the same time. For them I made many fillings, but no tooth has been lost, and for the last five years no filling has been needed.

We might cite very many cases to show that the beginning power of decay is exerted mostly in youth, but deem it unnecessary. The time at which teeth are attacked varies very much in different cases, depending seemingly upon three conditions.

The first is the vis inita, second the physical perfection of the surface of the enamel; third, habitual cleanliness. It will be readily seen that teeth with deep pits and fissures will be attacked in the presence of a weak or moderate vis inita, when teeth of greater physical perfection would escape attack altogether. The same is true of teeth habitually unclean as compared with those that are clean. Both of these conditions vary the manifestations of the vis inita powerfully, favoring it in the one case and disfavoring it in the other. Therefore we have these three considerations before us in the study of the beginnings of decay. If the vis inita is naught we will have no decay. We must have a power or force acting to initiate the process. Mere pits, grooves, or other faulty formation, nor even uncleanness will induce it, unless, indeed, uncleanness carries with it the materies morbi. While if the vis inita be present, these circumstances will favor or disfavor its manifestation, and if the teeth be unequal in surface perfection, or habitual cleanliness, the expression of the vis inita will be unequal.

As we have said, this force is manifested mostly in youth, and when it is strong the teeth are attacked usually at about a certain time after coming through the gums. That is, if the first molar is found with a decay in its grinding surface two years after coming through the gums, or at eight years, the second molar is likely to have a similar decay when about the same age, or when the patient is fourteen years old. If the incisors have approximal decays five years after coming through, the bicuspids and first molar are likely to have approximal cavities at about the same time after they present themselves, or possibly the first molar may be attacked while approximating with the second deciduous molar, and so on with the other teeth in their turn.

Thus we see why it is that we have new cavities occurring continually between the ages of ten and twenty especially, and sometimes continuing until later in life, when the vis inita is less pronounced or more fluctuating. Of course we only present this as the most general rule to which the exceptions are sufficiently numerous. The modifying influences of surface perfection and cleanliness have their weight, which is often very powerful, in modifying the results, and if these are unequal among the different teeth, the manifestations will be unequal. After these come changes of condition as to health with their modifications; conditions which we need not now discuss, as we have considered them at length in a former paper. We will also find that the vis inita often begins to diminish very early in life, so as to lengthen the time between the occurrence of cavities in the different teeth.

Running all through our cases, however, there are many exceptions and exemptions. For instance, the lower incisiors are exempt from decay in a very large majority of cases. This is so very decided that we not unfrequently find them sound when all the other teeth have been destroyed. Again, it may happen that some other class of teeth are especially exempt, as the superior incisiors, or the canines—occasionally the bicuspids—but very rarely the molars. The wisdom teeth, too, often decay much earlier proportionately, than the other teeth, probably from some peculiarities of environment. All this tends to cover up and conceal the laws of which we have spoken. But when we come to compare a large number of examinations, or better still, to follow a large number of patients from childhood to middle age, the general rule stands out clearly and unmistakably.

The vis deleta—destroying power—of caries is also subject to various local modifying influences. It is especially and powerfully modified by the condition of the cavity as to its opening, progressing far more rapidly if the opening be small than if it be large, so as to give free ingress and egress to the fluids of the mouth. Indeed if the vis deleta be rather weak, decay, which is moderately progressive in a cavity, the opening of which is small, or partially closed, will cease altogether, if it be thrown wide open to the fluids of the mouth. Just here there is a very curious phenomena, which I have studied with much interest. Decay seems to be like the miner cutting coal. To work to advantage he must have a certain amount of room in which to handle his pick. If you cramp him he will go very slowly until he gains room for himself, then he will proceed rapidly with his work. It is just so with decay. While it is true that to progress most rapidly, the opening of the cavity should be partially closed, a moderately close filling of the cavity will interfere with progress for a time, until elbow room—if I may use such an expression—is gained.

It is for this reason that leaky fillings seem to protect for a time, especially in those cases in which the vis deleta is rather weak. However, if the vis deleta be strong, say 75, elbow room (figuratively) is gained so quickly that the decay seems to go right on without check.

Many noticing this in cases of very mild vis deleta, have come to the very erroneous conclusion that it is not necessary that fillings be water tight.

The changes in the destructive power consequent upon the breaking away of the wall of the cavity, and thus throwing it wide open to the fluids of the mouth, and still better to the attrition of mastication, we have seen exemplified in many ways. I was particularly struck with this last summer in my examination of the old Indian remains on the Mississippi. I spent some weeks in the work, and the results developed some curious facts not before known to me. One of these was the greater prevalence of decay among them than I had previously supposed. The second was the peculiar character of the decay. In a large majority of cases it was confined to the second class, nothing found but approximal decays. A very large proportion of these progressed until the over-laying enamel gave way, and then the hard food wedging into this broke out one side thus exposing the cavity to the attrition of mastication, which, with them, was sufficient to keep it clean and the decay came to a full stop leaving the teeth practically uninjured.

I did, however, find some dentures that had been practically destroyed. One, especially, of a young woman—the wisdom teeth just coming through—in whom the teeth were nearly all destroyed. There were also evidences of very severe alveolar abscesses which had made extensive burrows in the bony tissues.

This Indian girl seems to have been especially unfortunate, as she had had one femur and both bones of the forearm broken. The femur had healed witht wo inches shortening, and the arm with about one inch, and quite crooked. I also found a child six years old, with the temporary teeth very badly decayed.

The peculiarities above mentioned, of decay among the Indians, are sometimes seen among our own people. Decays are only found on the approximal surfaces, and the vis deleta being very weak the cavities are broken into before exposure of the pulp takes place and the decay comes to a full stop. The teeth are thus preserved through these natural and unaided processes. Such cases have occasionally come under my observation, as they doubtless have of most dentists of long experience.

Decays arising from want of cleanliness vary greatly as to time of life, but I am convinced that they occur mostly in youth or early maturity. How many decays of the first and second classes are really due to this cause is, of course, very difficult to estimate. I therefore include in this class only those that occur on the smooth and exposed surfaces of the teeth. They are seen mostly on the labial surfaces of the incisors and the buccal surfaces of the bicuspids and molars below the margin of the gum, always below the junction of the cement with the enamel. I think that I have sufficiently demonstrated the dependence of these decays upon uncleanness, or a local modification of the mucus, in my repeated experiments. It is well known that in these cases the tendency is for tooth after tooth to be attacked in succession, spreading either way from the point of beginning, (of course I do not allude to decays starting in congenital or other pits in these surfaces.) I have uniformly found that the daily use of the friction of the tooth-brush would prevent more teeth being attacked in this way.

We have yet to notice the fourth class of decay—those that occur at the margin of the enamel, or at the junction of the cement and enamel. These are peculiar to middle life and advanced age, occurring but rarely in young persons. We believe that the immediate local conditions of their occurrence are to be found in disease of the gingival margins of the gums, and perhaps the margins of the alveolar processes. This is marked by a thickened and irritated condition of the gums at the point, and usually some shrinkage away from the tooth. Some years ago I was inclined to the opinion that this condition was caused by the sharp edges of the cavity, but longer and closer observation has fully convinced me that the disease of the gum is first present, and the decay follows. The decays are not confined to any particular side of the tooth, but occur on the approximal as well as on the buccal and labial surfaces. Such decays also occur frequently where a partial plate abuts against the teeth, causing continued irritation of the margin of the gums. They sometimes progress rapidly and are very destructive, tooth after tooth falling a prey to their ravages. It occasionally happens that after the danger from the first and second classes of decay has passed, this fourth class springs into existence and wrecks the whole denture. We have lost the battle in several of these cases; in others, we seem for the time to have won the fight; and we have now under our care, several cases in which we are several times per year filling decays of this class.

VALUE OF FILLINGS.

In considering the value of fillings, we must at all times keep clearly in view the nature and habits of decay; its phenomena and tendencies—its particular characteristics in each individual case. If we let this escape attention in any case presented, we will have nothing upon which to base just conclusions. For instance, if we should take a patient at middle age, with a number of small, dark cavities, one in whom the vis inita is spent and the vis deleta is, and always has been very weak, and fill these cavities with amalgam, they would, if reasonably well done, remain good, and we might be inclined to point to the case as a grand success.

Again, let us take another case: The patient, a girl of fifteen or seventeen years, with a number of rapidly destructive decays, say vis inita, 50; vis deleta, 75, and make the best possible gold fillings in all apparent cavities. Within a few years this girl will most certainly show a number of decays advancing, and unless the fillings are absolutely perfect, there will be points about some of them that will need repair, or even if they be perfect, new points of decay are liable to present themselves in the immediate neighborhood. Now, we might be inclined to regard this case as to some extent at least a failure. In comparing these two cases without considering the nature of the diseased action with which we had to contend, we would certainly conclude that the amalgam had been the more successful, and therefore the better material; when, in fact, the reverse is true. The protective power of the gold fillings has really been very much greater than that exerted by the amalgam fillings, as would be shown if the cases were reversed. In the first instance the vis inita having been spent, there was no inclination to the formation of new cavities, and the vis deleta having always been weak and growing weaker, would easily be controlled by fillings approximately good, while the other case required absolute perfection in the filling of the cavities apparent, with a certainty of the appearance of new cavities in the near future.

This study of the case in hand, with a clear understanding of the phenomena of decay in their several degrees of manifestation, is a necessity to any just conception of the protective power of fillings. A few years ago it was announced by some one that it was not necessary that fillings should be absolutely moisture tight. While this proposition is false both in principle and in fact, observations made without an understanding of the degrees of the manifestation of the forces of decay, or proper consideration of them might seem to support such a conclusion. Every dentist of long experience has seen fillings manifestly imperfect, leaky, with a brown streak passing into the cavity on one side which have stood so for years. There has been enough action to produce a stain—show the leak, but the vis deleta being very weak becomes like the aged and feeble *miner* wedged in between two solid walls with his pick, without proper room to wield it. He works away feebly for awhile but finally smothers and dies. If, however, the vis deleta be strong, it is more like the *miner* in the prime of his strength, who, though cramped in a narrow crevice, soon gains elbow room and then wields his pick vigorously. Leaky, imperfect fillings afford protection only when but little protection is needed. Perfect fillings will afford protection to their cavities' walls under any ordinary circumstances.

The requirements of a filling of the strongest protective power are:

1. That the material be capable of *perfect* adaptation to cavities' walls, and of retaining that adaptation indefinitely.
2. That it be sufficiently resistant to the fluids of the mouth.

3. That it be sufficiently resistant to attrition.

No filling material yet in use has any continued virtue by reason of its intrinsic qualities as a material other than these. It is only by virtue of adaptation to the cavities' walls and the exclusion of the materies morbi that protection is secured. Those who use any material with any other end in view, must certainly fail in the end, no matter how profound a study they may make of compatibilities with tooth-bone, dentos, or what not, and the further their material departs from the three essentials given above, the more signal will be their failure.

These conclusions are based upon the observations of the greatest number of the wisest members of the dental profession. Then we have had a tolerably large personal experience, and fortunately we have kept such records of our operations that we may know whereof we speak. Among these records the number of failures (we say it in sorrow) is ample for comparison with the success.

The very best way of studying the value of fillings is to run over the records of those children who came to us years ago, and who have grown up to manhood and womanhood, to middle age, under our personal care. In studying these we must also estimate the value of the hereditary tendency of caries, for we all know that the especial liability to caries is more or less transmissible, Therefore, the history of the decay of the teeth of the parents must be known and considered. How many children have come under my care within the seventeen years that I have been in my present location, I do not know. Many come for a time and are gone and lost sight of, so that the number who have been constantly under my care and under the care of no other, is small, as I suppose it will be found to be with others. We can count about thirty who came to us, at from eight to fifteen years old, and whose parents, one or both, had lost their teeth from decay. These patients are now from twenty to thirty-two years old, and not one of them, nor any other who has been regularly under my care from childhood, wears artificial teeth of any kind, or needs to wear them. Not a tooth has been lost that had not an exposed or dead pulp at the time we first saw them, except such as were extracted on account of irregularity, *and no plastic fillings have been used.*

No table I am able to construct will give a fair shewing of these cases. The vis inita differs very considerably, so that the decays have occurred at very different periods as to age, which would confuse any table we can devise. Perhaps I should, in justice to myself, say a word, before giving cases from my records, in regard to some of my habits of practice which probably differ somewhat from my fellow-practitioners. For instance, in case I conceive the vis inita to be strong, I never, or very rarely, make what is called a pit-filling in the grinding surface of either the molars or bicuspids, but when a filling is required in one pit, I cut away the other, and all radiating fissures, uniting them in one filling. In the approximal surfaces I cut away all the approximating surface whether the cavity be large or small. For these reasons the number of fillings is reduced, as I think, nearly, or quite one half from what it would be if I filled every little cavity and stained pit. We will now give a few cases illustrating the success that may be attained by fillings.

Miss F. came under my care in 1866; was at that time 14 years old. Her father had lost all but the incisors and cuspids, and these were each protected by fillings, both upper and lower. The mother had lost all but the incisors in the lower jaw and a part of the anterior teeth above.

Year	1866;	age	14;	5	decays	of 1st class;	1	of 2d	class;	Total,	6
“	1867	“	15	3	“	“	1	“	“	“	10
“	1868	“	16	1	“	“	1	“	“	“	12
“	1871	“	19	1	“	“	2	“	“	“	15
“	1872	“	20	3	“	“	1	“	“	“	19
“	1873	“	21	1	“	“	0	“	“	“	20
“	1874	“	22	1	“	“	0	“	“	“	21
“	1875	“	23	0	“	“	2	“	“	“	23
“	1877	“	25	0	“	“	3	“	“	“	26
“	1878	“	26	0	“	“	2	“	“	“	28
“	1879	“	27	0	“	“	2	“	“	“	30
“	1880	“	28	2	“	“	1	“	“	“	33

There was one repair of a filling in 1867; 1 re-filling in 1871; 1 re-filling in 1872.

These re-fillings were in the first lower molars. In these the pulps were dead and alveolar abscess formed when the patient came under my care. The walls of the cavities broke away, and the crowns were cut down half way to the gums, and re-filled to that height, and they are doing duty in that shape. No other filling has been lost, no tooth has been lost, and there are now no imperfections worthy of notice apparent about the margins of any of the fillings. *No plastics were used.*

Miss S., aged 12 years. The mother wears full plates. The father had lost more than half of his teeth when he came under my care, and the rest were protected by about twenty excellent fillings.

Year	1870;	age	12;	2	fillings first class;	4	second class;	Total,	6
“	1873	“	15	4	“ “	2	“ “	“	12
“	1874	“	16	0	“ “	2	“ “	“	14
“	1877	“	19	4	“ “	6	“ “	“	24
“	1878	“	18	0	“ “	2	“ “	“	26
“	1879	“	19	1	“ “	1	“ “	“	28
“	1880	“	20	0	“ “	4	“ “	“	32

One re-filling in 1878; 1 re-filling in 1880.

The patient was married at 18 and has borne one child.

We give these cases from our record as fairly representing the average results in the thirty cases alluded to, and with these two, the whole number as representing the results that may be obtained with gold fillings, believing that no such success can be attained with any plastic material now known to the profession.

These cases though not the worst, are bad cases, as the number of fillings show, and all past experience proves that there would have been almost complete destruction of the teeth but for the fillings. The patients, however, have done their part of the work. They have obeyed instructions and have been prompt to report anything wrong, otherwise we believe such success unattainable with any material.

In several families under my care, a part of the children have been prompt while others have been neglectful. The difference in result is strikingly apparent, and we think demonstrates unmistakably that a larger number of decays will occur if cavities are allowed to progress unchecked.

My most signal failures have been in those cases that come to me with the teeth badly wrecked between the ages of 18 and 22, especially in women who marry young and bear children. In such cases I have learned to expect some fillings to fail and that new cavities will occur rapidly. A close watch must be had for several years in order to secure good results. It would seem as though with the unchecked riot of the carious process, an *intensity* is attained which requires an unusually great effort to check; and indeed it seems it cannot be checked at once, but must be brought about by a persistent effort. It may be compared to checking the movement of a ball that has acquired a great momentum.

Older patients with similar conditions as to the progress of the decay are easier to manage in proportion to the age (provided the decay be not of the fourth class,) that is, given a certain amount of destruction by decay; the case is easier managed if the patient be 30 than if he be 18 or 20 years old.

We will give a case illustrating this point: A young lady, 17 years old, came under my care in 1870; four teeth were extracted, and fillings were made as follows:

At 17,	9	of the first class;	5	of the second class....Total,	14
" 20,	2	" " "	13	" " " .... "	15
" 23,	2	" " "	0	" " " .... "	2
" 24,	1	" " "	1	" " " .... "	2
" 25,	0	" " "	3	" " " .... "	3
" 27,	0	" " "	0	" " " .... "	0
Totals,	14		22		36

One refilled in 1877.

Now, this patient returned three years after the first fillings were made with fifteen new cavities, with her teeth again in very bad condition, yet every filling previously made was perfect. It may be that a number of these new cavities were in progress, but as yet very slight, when the first fillings were made; but at the time nothing more was thought to be required than close watch for new cavities, which it seems the patient did not do. After the filling of these cavities the case seemed to be fairly under control, and I now suppose that a filling once in three or four years will be all that will be required. *No plastics.*

Another case: A lady came under my care, aged 28, at about the same time. The condition of the mouth was rather worse than the preceding. Eighteen fillings were made at first. After that time two fillings and two repairs complete the list of operations.

These cases illustrate the general rule, but of course we meet with exceptions. I have gradually come to understand that my better class of patients, who came to me as children and are prompt to report at the first intimation of anything wrong, cease to be remunerative patients after the age of thirty, provided that nothing but gold fillings have been made.—*Trans. of Ill. State Dental Society.*

ARTICLE II.

Progress of Dental Surgery in the United States.

Opening Address of Dr. J. B. Patrick, of Charleston, President of the National Dental Association, before the Recent Meeting in New York.

Gentlemen of this United Convention.—I congratulate you that we have been permitted to assemble once more in a representative capacity for the purpose, not only of interchanging thought concerning the progress of our profession, but of renewing the pleasant social relations that have proved such a bond of union between many of us in the past. In the interval that has occurred since the members of the respective associations now present met together, changes have undoubtedly taken place in our respective homes for better or worse, as the case may be, but here we meet in common to take note of those changes only that have influenced our several societies, and to put the stamp of our fresh initials on the milestones that mark the progress of our science.

It is a source of gratification likewise to observe the spirit of unity and cordiality with which the Convention has assembled. Coming as we do from remote portions of our common country, some from its villages and towns, and others from its great cities, where abound mighty opportunities for observation and improvement, I trust that all of us have brought hither more or less of the results of our experience, and are prepared to contribute the same to that which at the end of our deliberations may be regarded as the voice and intellectual outpour of this body.

Of the importance of such a national organization as we contemplate there can be but one opinion. Without interfering with the lines of demarcation that surround the local societies, or seeking to disturb whatever of good may emanate from their existence, our present effort should be to consolidate all interests that are mutual, and stimulate all purposes that have a common object. Of jealousies among us, thank God, there are none; but of high aspirations there are a multitude, and whether we come from the Dental Society of the State of New York, the American Dental Convention, the American Dental Association or the Southern Dental association, it is that we may stand shoulder to shoulder in achieving the grandest results that may be commanded by unity of thought. In the promulgation of this thought we shall find our main strength, for it will flow from a centre whose interwoven fibres are in themselves strong, and whose forces need only to be distributed through the arteries of one homogeneous body to attain all the possible benefit that can enrich our profession. Permit me to say that this I regard as one of the largest elements of our success, for while each State may in time possess its local society—and the more the better—each will contribute of its membership to the grand national association that we have in prospect, and thus through attrition enlarge the field of our experience, and supply from many sources food for our instruction.

The necessity for such a concentration of useful influences must be apparent to even a superficial observer. If we scrutinize the records we find scattered through them information of no inconsiderable value, and yet it might be made doubly so if it could find voice through a national vehicle, instead of being scattered like oases in the broad Sahara of dental literature. Do not let me be misunderstood. I bow my knee in tribute to the noble army of authors and essayists in our profession who have done and are doing so much to disseminate knowledge, but you will concede that where the gleanings are so numerous and the scope of discovery is so wide, there is a greater need than ever, that as a community interested in every new fact bearing on our science, we should be enabled to avail ourselves of every step in advance; and this, gentlemen, is one of the advantages that will accrue from our national organization.

The age in which we live everywhere witnesses the crystallization of ideas, and their march through given channels. The generation is eminently practical and utilitarian. We are creating as much as we are improving. Each speciality has its Columbus, and each Columbus is making his voyage of discovery, and on it is thrown a camera that exhibits in the brightest light the progress and development of the art or science to which that specialty belongs. Scan the field of medicine, anatomy and physiology, and recall the many departments into which it has been subdivided, and on which are at work some of the grandest intellects. Mark the labors of the engineer, the bridge, the railway and tunnel builders, the men who are making steam and electricity handmaids of the people's growth, and leaving an impress deeper than ever was cut before in the history of mankind. See Edison in his laboratory patiently revolving problems for supplying light and giving life to machinery through a new motor. Note the little vessel that has just crossed the Atlantic to test the practicability of condensing and reusing its own steam, and economizing by many per cent. the use of fuel, thus annually saving millions of dollars. See chemistry simplifying the arts that they may be domesticated. Observe the perfection of travel on your elevated railroads, the bridging of the East River, the tunneling of the Hudson, the opening of the Suez Canal, the boring of the Alps between Italy and France, in short, turning the eye on every side and where in a similar period of the world's history have grander results been achieved?

And what is true of other departments of science is equally true of our own. Our brainworkers have not been idle, and our tablets are scored all over with the intellectual victories that have been won by the members of the dental profession in their encounters with the inexperienced that characterized to a considerable extent its incipiency as a profession less than forty years ago.

It would require more time than may be permitted in a brief introductory address like the present to review the changes and improvements that have taken place among us, even during a quarter of a century. There are those here who remember how the tooth puller, the barber and the country peddler went almost hand in hand, and there was no thought that we should live to see the delicate and effective appliances now in use for preserving and perpetuating the teeth and removing the evils of hereditary growth. Art has, however, changed the then existing conditions. The freaks of nature have come within the domains of scientific mechanism, and the degeneration caused by luxury or vice is obedient in its yielding to the exact law through which we enforce a return to Nature and the designs of Nature's God.

While a few years ago the dentist was regarded as little better than a mere artisan, whose knowledge did not extend beyond his simple tools of trade, to-day finds him recognized as the member of an honorable profession, interlinked with every other connected with the science of Anatomy and Physiology, and a contributor to and an important adjunct of the art of healing and reproduction. It has been well said that it requires greater professional skill "properly to handle the teeth than it does to set an arm or extract an eye." This may seem to be a broad assertion, but there are many among the present constituency who have at various times in their experience been brought face to face with cases in which the nicest judgment of the surgeon, the most exhaustive skill of the anatomist, and the keenest touch of the operator were required to produce the effect desired.

It has been estimated that the 12,000 dentists in the United States annually pack into the teeth of the people not less than half a ton of pure gold, costing half a million of dollars, besides about four times as much cheaper material, such as silver and platinum, worth $100,000 more. It is also said that there are made every year about 3,000,000 artificial teeth mounted on gold, platina, rubber, or other materials. These facts, if correct, will convey a partial idea of the activity of our profession, and yet it may be safely asserted that not more than one person in twenty has perfect teeth. Such a vast dentile must naturally suggest that we cannot remain idle or unmindful of opportunities. We have to study complex conditions without number, and to avail ourselves of every discovery in other arts that can possibly affect our own. For years chemists and others have been engaged in voyages of exploration to discover something that shall more perfectly harmonize with the dentos than the metals which we use at present, without the present drain upon the operator and the patient, but we have progressed only in so far as to learn the extent of our deficiencies. I need not further dwell on this point. Time, experience and the laboratory must give us the solution of the question that is involved in this department of our science. That some substance will eventually be accepted by the profession as an equivalent of the best now in use, and superior to all others yet in use, as regards durability and affiliative qualities, I have no doubt. Meanwhile we can only be patient in utilizing the materials at hand and noting the experiments that are from time to time reported by our co-laborers in the field.

In this connection it is gratifying to record other results as the outgrowth of the improvement that has taken place in our profession during the last quarter of a century. Admitting all the advantage that has accrued from desirable and effective mechanism and the use of instruments that a few years ago were unknown, it is the universal testimony that dentists nowadays operate with greater delicacy of touch, affording less inconvenience to the patient, and leaving behind fewer of the after traces of treatment that were observable in former years. I do not stop to question that this is an important point gained, for it is answered by the fact that we possess greater facilities than before, even though they may not be accompanied by a superior intelligence or an experience any more diversified. Manipulative skill may be said to have become subjective to machinery.

Again, the suggestive instructions of the collegiate course have more or less exercised a predominating influence upon the profession. Some among the students have found occupation for their talent in the perfection of artificial teeth; others have made a specialty of contrivances for the correction of irregularities and the removal of deformities; many have devoted themselves simply to the art of filling and making perfect the teeth, while a few animated by a noble ambition have sought to cover all these aims and be prepared beside to stand in the forefront of their profession, ready to respond to the grandest requirements of the science, and with their knowledge of constitutional or theoretical treatment, when needs be, aid their professional brethren in other departments of the healing art.

In no sense, therefore, has our profession deteriorated. We stand before the public a compact, solid mass of educated gentlemen—the servants and the confidants of that public—and intent only on the alleviation of the suffering that is the common lot of humanity. While we are moving forward with all consistent speed, availing ourselves of all the factors that make the world's sum of progress, we are content to be measured by the modest achievements that come strictly within the purview of our life's work. Our duty, however, does not alone consist in meeting our adversary, disease, half way; he must be met at the threshold.

Brought as we are into daily communication with father, mother. and children, frequently covering more than a generation of growth, it is possible for us, both as individuals and as an organization, to do this, to educate the masses and to teach them somewhat of that harmony of life that is demanded by physiological law and the inevitable lesson that follows disobedience. I have no hesitation in saying that the next generation will witness a greater abnormality in dental development than we have yet seen. It is for this simple reason that there is a great tendency to nervous and cerebral diseases, resulting from fast living and injudicious food. It shows itself particularly in the precocity of children. It is in my experience that in a majority of cases your precocious child has a mouth full of fangs, and a dental organization throughout that is hereditarily bad.

To us, gentlemen, belongs the task of interposing our skill as a barrier to the encroachment of these and all other forms of dental disease. In conclusion, gentlemen, I have but a few more words to utter. Our Convention promises to be an important one, the most important events indeed in the history of the profession. You are in person the embodiment of the growth of that profession, and you have reflected honour on its shield. Science in your hands has suffered no corruption nor has been permitted to stagnate.

While there may have been a long interval between the seed and the timber, we have already seen the bud and flower and fruit; we are progressing step by step toward still higher planes, with the consolation of knowing that what is gained by one man is invested in all men, and is a permanent investment for all time. Again felicitating on the occasion that has brought so many of our number together, and expressing the hope that it will be productive of the pleasantest memories, I announce this Convention ready for the transaction of business.

ARTICLE III.

A Long Practiced and Successful Method of Capping Exposed Pulps, with Cases in Practice.

BY M. S. JOBSON, PERRY, GEORGIA.

[Read before the Georgia State Dental Society.]

Since cements have come into use in filling teeth the old way of capping exposed pulps with gold and other material, which was practiced to a very limited extent, has come to be a thing of the past, and by the use of cements the operation has been brought to a basis of safety and certainty. Capping with gold required the nicest manipulation, was very tedious and very uncertain in results, and was consequently attempted by but very few; but with the cements the work is short and simple, and with it nearly every exposed pulp can be saved.

Extirpation should now cease. We should save the teeth of the people with the nerves in them, and there is no reason why every good operator should not succeed in doing so, and he who does succeed will have abundant cause for self-gratulation, and will save his patients much pain, time and money.

Other methods, differing some from the following, have appeared in print and been noted, but I do not think that by them success is so sure as by this. For the best results, the tooth should be dealt with very tenderly until the nerve is safely under the capping. Excavate in a way that will give no pain, where that is possible, and in syringing use water of a temperature that will give no shock. In the majority of cases every particle of decay should be removed from over and around the pulp, however large that may make the exposure. The floor of the cavity immediately around the exposure make flat and smooth in every case where it is possible. The membrane of the pulp is then clipped, and as much blood let out as will come, and where the pulp has been much irritated, or is very red and the blood comes very slow, it should be encouraged by tepid water. The rubber dam is now applied, and the cavity dried and flowed with carbolic acid. In every case that will do for immediate capping; the tooth will be perfectly easy and comfortable after the hemorrhage and application of acid, and where it is not a slight quantity of carbolic acid on a small pellet of cotton should be lain in light contact with the nerve and a loose piece of dry cotton placed over that and kept there some minutes or hours, as may be necessary to bring the tooth to a perfectly comfortable condition, and until then no capping or stopping should be put in. Where the tooth is not quickly relieved of all pain the capping should be deferred several hours, or until the next day.

Over the exposed pulp and on the smooth floor around it lay one to four thicknesses of strong, bibulous paper, cut to proper size and shape, so it may not wrinkle when the cement is carried down against it. Japanese or French bibulous paper will not do for this; the cement may pass through the first, and the latter is liable to break under it. If all the carbolic acid has now been absorbed the cavity is again flowed with it. The cement is then mixed thin and a small batch carried into the cavity with spatula, and down to place on the paper and floor of the cavity with a piece of spunk or soft bibulous poper, particular care being had not to carry the cement down enough to bear or press in the least upon the pulp, but enough that there may be no space between the pulp and capping. If the capping bears upon the pulp, failure will certainly result. This first batch of cement being thin where it is carried down to place, unites, to some extent, with the carbolic acid, and the paper or spunk with which it is carried to place absorbs the surplus carbolic acid and liquid of the cement. If the first pellet does not dry it sufficiently, as many as may be necessary to do so should be used, thus hastening the setting, and the cement thereby becoming harder. More cement is then carried in and to place in the same manner, until the capping is of thickness desired or the cavity full, and the work is done, in so far as capping. In most cases the capping gives little or no pain, and if the pulp and surroundings of the tooth are in proper condition to be treated this way success may be expected in forty-nine cases of fifty.

In almost every favorable case the pulp, under this treatment, will recede and throw out bony tissue or be tiself converted into tooth structure. I have never used any of the advertised non-irritant cements, or those prepared especially for this purpose. Have used Houghton's Os-artificial, Smith's Oxychloride of Zinc, large and small packages, Cement Plombe, Guillois' Cement, and Agate Cement, all with equal success. I have been treating exposed pulps in this way since a few months after I began the practice of dentistry, and now after thirteen years' experience, I am prepared to say that there is no way of treating such teeth that approaches this in safe, certain and satisfactory results.

CASES IN PRACTICE.

Case 1.—In 1872, while filling a tooth for Miss P., I was particularly asked not to touch the second left inferior molar, as it was exceedingly sensitive, and would have to be taken out. The tooth was largely decayed on grinding surface, but elsewhere and otherwise was in perfect condition. The pulp lay bare in the cavity. After persuasion she consented to let me see if I could fix it without too much pain. In less than two hours I had the tooth completed with a gold filling. A little girl stood on an ottoman by my chair and did the malleting with a steel mallet. Capping nor filling gave any pain, and she declared some months after it was the best tooth she had.

Case 2.—In 1872, Mr. W. complained of the second left inferior molar troubling him. I found a portion of the pulp dead. Removed dead part, capped the remainder and filled with amalgam. This tooth has been and is to day in a perfect condition.

Case 3.—In 1874, Mr. C. called, with severe toothache. Pulp exposed and very red. Removed all decay; clipped pulp membrane, and by aid of tepid water, drew all the blood that would come. Applied rubber dam, flowed cavity with carbolic acid, placed bibulous paper over pulp, and filled cavity up with cement. Six or eight months after took out what cement remained and no pulp was visible. Cut up into the tooth as far as the neck without giving any pain or finding the nerve, or any indication of one. Filled with gold. If I remember correctly, the tooth had not given a tinge of pain from the moment I dismissed patient after capping. The operation throughout was perfectly satisfactory, and so far as I am aware the tooth remains so to this day.

Case 4.—In 1874, Mr. M. (now Dr. M.) complained of a tooth that had been filled with amalgam. After using, in vain, every means of relief I could, I removed the amalgam, which I found was in contact with the nerve. Blood flowed immediately and for several minutes, and I encouraged with tepid water. After hemorrhage ceased I placed a small pellet of cotton saturated with carbolic acid in contact with the pulp, and a loose piece of dry cotton over that and dismissed him. The tooth in a few hours got into a comfortable condition, and the next day or day after I capped and filled up cavity with capping. The tooth remained in a perfectly satisfactory condition, and after a few months excavated a portion of the cement and filled with gold. The cavity embraced the anterior proximal and grinding surfaces. The tooth was in the best possible condition two weeks ago.

Case 5.—In 1875, Miss C. came with the palatine wall of the second right superior bicuspid broken away. The tooth had large gold fillings in both proximal surfaces, but that only in the posterior came out. In proceeding to excavate for refilling I found the pulp had been capped. The capping came out in one mass, and I found the pulp chamber vacant. I drew out with a broach a part of the pulp alive and occupying the end of the fang. The tooth, under and around the capping was of a brownish hue, as was also the cement, but both were sound and hard. There was not the slightest disagreeable odor in the pulp chamber. The tooth had never given any trouble since it had been filled. I made no note of this capping, but found by my registering ledger had filled the tooth in September, 1869.

Case 6.—August, 1875, Miss E., first right inferior molar; large decay, embracing buccal and crown surfaces. The pulp of this tooth had enlarged or grown up to near the orifice of the cavity. Excised down to surface of its chamber with comparatively little pain. After bleeding, which was profuse, excavated and filled. The tooth had not troubled her much. In 1877, she complained some of the tooth, and I removed the filling, somewhat against her will. I do not remember whether the pulp bled any of itself after removal of capping, but I drew from it all that would come, capped and filled again, and there has been no trouble since. I found on removing the capping in this tooth the pulp had contracted, or receede, and the chamber between it and capping was vacant.

Case 7.—March 27th, 1879, Mrs. P., right superior lateral incisor—corner broken away. In excavating for anchorage exposed the pulp; capped and filled cavity with capping in usual way. June 27th, 1879, removed all the

TABLE CONTINUED.—

Degrees of Temperature, Fahrenheit.	*Elastic Force, in lbs. per square inch.*
293.72	58.8
300.28	66.12
307.05	73.5
314.24	80.85
320.36	88.2
326.26	95.55
331.70	102.9
336.86	110.85
341.78	117.6
350.78	132.3
358.88	147.
366.85	161.7
374.00	176.4
380 66	191.1
386.94	205.8
392.46	220.5
398.48	235.2
403.82	249.0
408.92	264.6
413.78	297.3
418.46	294.

It will be noticed that as the temperature rises, the pressure of steam increases in a constantly increasing ratio for equal increments of heat; the pressure being more than doubled by the addition of fifty degrees to the temperature. This fact will show the *absolute necessity* of care and watchfulness while vulcanizing. For additional security, each vulcanizer is provided with a safety disk, which is intended to give way at about 340°. It must not be relied upon too implicitly, as no such arrangement can be made *absolutely certain* in its action. Moreover, as there is a constant liability in any kind of apparatus to get out of order, too much dependence should not be placed upon the indications of the thermometer. If the usual size flame does not heat the vulcanizer in about the usual time, the condition of the thermometer should be ascertained at once. The bulb will probably be found cracked or broken. A second tube and scale should always be kept on hand, ready to be substituted in case of any accident. If the thermometer case should be unscrewed from the vulcanizer top, a small cup will be seen in the nipple from which the case is removed. This cup should contain sufficient mercury to insure its touching the bulb of the tube when the thermometer case is screwed down properly. This makes a *metalic connection* between the thermometer bulb and vulcanizer cap, and is *absolutely necessary* for the proper indication of heat by the thermometer. If the safety plug should blow out at a degree of heat lower than 340°, it is probably because there is not sufficient mercury in the mercury cup and the thermometer should be removed and more mercury added.

In heating up, let on just flame enough to cover the bottom of the boiler, *not to flow up the sides.* A large flame overheats the outside, burns the packing, and damages the whole apparatus, without materially hastening the rise of the mercury.

If alcohol or kerosene is used, let the wick of the lamp be quite short. If gas is used, a flow of 2 to 2½ feet per hour is all that is required in heating up. After the mercury is up to the desired point, a very small flame will keep it there."

A great deal of unnecessary annoyance is experienced by dentists in the matter of blowing out the safety-disks, from the practice of filling or nearly filling the Vulcanizer with water. At least half an inch, or better, one inch of steam room should always be left. Water expands one-twenty-second of its volume by an increase of temperature from the freezing to the boiling point, and its rate of expansion increases with its temperature, so that at 320° it will have expanded at least one-tenth of its original volume. As water possesses but little elasticity, this force is practically irresistible. A Vulcanizer built of steel an inch thick could not stand the strain it would be subjected to if filled so that it had only one-twentieth of its capacity for steam room, and heated to the vulcanizing point. Some years ago, when the fusible safety valve was in use, a Whitney Vulcanizer was returned to the manufacturers, which was stretched, or enlarged in its diameter nearly a quarter of an inch. A series of inquiries revealed the facts: 1st. That the enlargement was gradual, several vulcanizations having been accomplished before the whole amount of enlargement was attained. 2d. The Vulcanizer had not been overheated. 3d. The dentist always used soft water and *always filled his Vulcanizer brim full.* This fact accounted for all the trouble. When the copper disk is used, the Vulcanizers cannot be subjected to such a heavy strain as the one before mentioned, as the disk will give way by pressure, irrespective of the temperature.

By experiment it is found that a No. 2 Hayes Boiler, if filled with cold water, will blow out the copper disk at about 310°. Under similar circumstances, with the No. 3 Hayes Boiler it will give way at about 260°, there being a greater mass of water to expand in the case of the No. 3 boiler. With the Whitney Vulcanizer, which can be filled nearer the top than the Hayes Boiler, the disk will give way at a still lower temperature.

In view of the foregoing, the absurdity of the following letter will be apparent:

"The Vulcanizer you sent me is a total failure. On Saturday it blew off at safety-valve four times, when the thermometer indicated 320°. We tried two disks instead of one, and they blew through. On yesterday the Vulcanizer seemed to work better, and had been standing at 320° for twenty-three minutes, when off it went, blowing through the bottom, etc."

An inquiry directed to these parties elicited the reply that "at the time the Vulcanizer *was full of water.*"

Only those who repair Vulcanizers can have any knowledge of the amount of abuse to which they are subjected. The wonder is not that they explode, but that explosions are so infrequent. The safety-disk is often replaced by a piece of metal too thick to give way under any reasonable amount of pressure, and nothing but an explosion with a narrow escape with life will convince some dentists of the foolhardiness of thus tampering with the only safeguard against careless overheating, to avoid the occasional annoyance occasioned by the blowing out of a disk. It is nothing uncommon to see the bottom of a Vulcanizer bulged into almost a hemispherical shape, and the sides expanded a quarter of an inch, the safety-valve plugged up, and the whole apparatus in such a condition as to betoken the most extreme neglect. In conclusion, we can only say that a Vulcanizer is not a thing to be trifled with, and that the person in charge of one should be careful, and well informed as to its proper use.—*Dental Advertiser.*

ARTICLE V.

Prophylaxis, or Prevention of Dental Decay.

BY C. C. PATRICK, D. D. S., OF CHARLESTON, S. C.

[Read at N. Y. Meeting of Southern Dental Association.]

The efforts of those in charge of the Dental organs have been, from time immemorial, directed more towards limiting of the ravages of decay after its appearance than the adoption of a thorough and systematic method of *preserving* the teeth as their great Creator intended they should be—beautiful and perfect in their *simplicity*, unmarred by the art of the skillful Dental Surgeon.

Man (and every part of him,) was created perfect, and as long as he followed the laws and partook only of the good things Nature provided, his several organs performed their functions with such simple regularity that the diseases which now afflict us were almost unknown. "Men," of course, "died and people buried them," but "hardly ever" of syphilis, consumption, scrofula, or diseases of the digestive apparatus. The curse, "in pain shalt thou bring forth children," was intended to people the earth and to fill the grave yard. In all primitive communities where nature's laws have not been transgressed, the acts of parturition and teething caused as little anxiety and were fraught with as little danger to mankind as the brute creation. The savage, who, a half hour after giving birth would, with papoose on back, continue her march as if nothing had occurred, never dreamed of the obstetrician's forceps or

Cæsarian operations. The cutting of the teeth, which now brings grief and distress to almost every household in civilized countries, caused no fear in the simple societies of olden times, and does not seem to be fatal in the barbarous or rural tribes of modern days.

Though man in civilized countries of to day may not be more prone to destructive constitutional diseases, or have worse teeth than the luxurious Persians, Greeks and Romans of old, it is only in the frugal, nature loving country people of modern times that we can hope to find an approach to pristine excellence and perfection. The child of nature is always perfect; that of luxury and vice, a caricature. It is also too true that the "wages of sin is death," and few sins are greater than the wilful destruction of self or any portion of one's self. As surely as man transgresses the laws of nature in any age or any clime will he pay the penalty. As surely as he discards the most important and nutritious elements of food and then fixes up what remains in all manner of unrecognizable forms and bolts it without first putting the system, by exercise, in condition to assimilate it, will he destroy his originally perfect organism, bring disease and misery on himself and require the aid of Physician and Dentist. As sure as he gives unbridled license to his animal passions will he stamp his sin on millions unborn and bequeath to innocents destructive constitutional diseases that the brute creation know not of—diseases so destructive that it has been said, that could syphilis be stopped one half the diseases which now afflict mankind would disappear from the face of the earth. But as it is not probable that man will curb his desires or deny himself anything in an age where luxury, false notions and vice are the rule and not the exception, the effort to benefit him by showing him the error of his ways and leading him back to a proper mode of life, will be attended with enormous difficulties and successful only in as much as we receive her co operation. But that *should* not deter us as dentists and humanitarians from doing all in our power to build him up and give him good sound teeth. This we cannot do alone. The teeth are so intimately connected with the general system, sympathizing with, affecting and being influenced by all changes in it, that we could not hope to succeed in benefiting them by merely local attention, nor would the best constitutional treatment at this period make a perfect set of teeth. The health and strength or disease of them is implanted so early that it would be the height of folly to wait until birth to try to build a perfect structure on a weak or imperfect foundation. Treatment to be effective should be from the very beginning.

As *our* case begins with our *patient* in the *office*, and as all preventive measures should have taken place before this, it is our duty to associate with us those who have to stand at the helm and pilot him safely into the world. The Physician now recognizes the intelligent Dentist as a specialist of his noble profession, and is no longer averse to consult with or to give to his care cases which more strictly belong to the province of Dentistry.

There are here, gentlemen, no conflicting interests, no professional jealousies to excite, and the union can only result in the greatest good to mankind and be of incalculable assistance in the endeavor to preserve teeth from decay. How else could we hope to successfully combat the evil influence of disease or build up and restore to health weak and broken down constitutions. It is, therefore, incumbent on us to work faithfully and conscientiously together, and in order to have our efforts crowned with success we must commence our treatment with the woman in the earliest stages of pregnancy. We must frequently examine her mouth and see that all particles of tartar and other foreign bodies are removed, and the secretions and soft parts are in a normal condition. The greatest cleanliness should be enjoined and at the same time she should receive a most generous diet and a great deal of open air exercise. The food should abound in the bone and teeth producing phosphates. Should she be weak or delicate, tonics and the phosphates, or carb. phosphate of lime in cod liver oil or otherwise, should be administered, thereby preventing injury to the mother and assisting the little one in uteri. The same care regarding exercise, diet and attention to the oral cavity should be shown her after delivery. Should her milk be of any but the best quality it should be immediately stopped, and goats, cows, or still better, that of a healthy woman of sound parents, supplied. But as this class of beings is not over-moral, and prone to deceive, too much care cannot be exercised in the selection. No woman suffering from syphilis, consumption, scrofula, or any of the forms of insanity, should under any circumstances be allowed to nurse a child.

Should the offspring inherit a constitutional taint, or develop dyspepsia, a most thorough system of treatment should be instituted. When nature, by the eruption of the temporary teeth, denotes that a more solid and substantial food than milk is necessary, food with a large percentage of the phosphate of lime should be given ; such, for instance, as barley bread, oat meal, cracked wheat and unbolted flour. Too much stress cannot be laid on the avoidance of the abuse of candies and sweet-meats, for though they may be retained in the mouth without serious injury, they destroy the digestion and thereby the teeth. Fresh air, exercise and great bodily cleanliness are of a great importance to the young or the old. The child should be taught to brush its teeth as soon as it can handle a brush, and previous to this the mother or nurse should do it. The mouth should be frequently examined, particularly after illness of any kind, where acids or strong medicines have been used. All broken down, deciduous teeth and all impurities, injurious to the permanent, should be removed and the mouth rendered healthy. Crowded and irregular teeth should be filed, extracted, or brought to proper position in the arch as the judgment would dictate. And, in short, gentlemen, nothing should be left undone by Physician and Dentist to remove all causes, constitutional or local, favoring in the slightest degree decay.

EDITORIAL, ETC.

Maryland and District of Columbia Dental Association.—Annual Meeting.—The annual meeting of the Maryland and District of Columbia Dental Association was held in the parlors of the Imperial Hotel, Washington, D. C. on the 27th, 28th and 29th of October last. The attendance, while not very large, was made up of intelligent and active workers, and much interest was manifested in the proceedings transpiring from day to day. Most of the sections made reports, which gave rise to considerable and often animated discussion. This was especially the case when the subject of the careless administration of anæsthetics came up for criticism.

Among those visiting the annual meeting from other States, were Drs. Wm. H. Atkinson of N. Y., and Drs. Marshall H. Webb, and Baker and Underwood, of Pennsylvania. Clinics were held by the three last-named gentlemen, with the view of exhibiting the excellence of the electro-magnetic mallet, which certainly, in their hands, did most beautiful work. Dr. Webb used also a burring engine driven by an electric current.

Among others visiting the meeting was Dr. Reese, of New York, who demonstrated the working of his new metal for artificial dentures, the process being a modification of the ordinary stanno-plastic method.

In all respects the meeting was a pleasant and harmonious one, and useful also. The next meeting will, according to the rules, be held in Baltimore, and the time of meeting has been changed to September, as being more convenient, and encroaching less on the busy season. It is understood that the gentlemen who so kindly gave the Association their presence, will visit the Baltimore College of Dental Surgery, and give clinics in the presence of the large class in that school, sometime during the Winter, and that other distinguished members of the profession will be present also, and aid in demonstrating various methods of operating. H.

To Our Young Men.—A Caution.—Nothing is more captivating and seductive to a tyro than the witnessing the performance of clever and elegant operations by experts. The novel methods, the dextrous manipulation, the beautiful results are seen, and the endeavor is made to imitate them; often and usually the imitation being a very bad one indeed. More especially are young men apt to imitate the *rapid operations* in dentistry they see at the hands of those giving demonstrations, and this is written as a caution, to them seemingly useless, yet really important. Rapidity with excellence can rarely be attained, and if attained, the two come only from long years of patient practice and training. Often they altogether refuse to go hand in hand, and in that case one must be content to be excellent and not rapid. Most of the really good dentists known to the writer are slow, doing very little work in a day.

We write then this caution to our young men, who are watching in the hope to catch the rapid yet sure strokes of some man of genius whose work they see. Strive first and all the time for the excellence you see, and hope for the dexterity. If it comes, well—if not, do not sacrifice any of your precision and painstaking for it. H.

Socket Instruments are old in idea, and the itinerant dentist of years past, whose "kit" was purposely made as light as possible, devised various handles for holding bits, more or less clumsy and liable to motion in the joint. Neat, light handles for excavators and pluggers, (cannot we get rid of that ugly word "plugger?") are soon spoiled in our attempts at repointing, and a handle into which the point can be easily screwed and removed, and which can be kept neat and bright, is a desideratum. This the Messrs. Johnston Bros., of New York, have done some time since, supplying the profession with a set of light steel nickel plated handles, beautifully milled in various shapes, for convenience of recognition, and from which the points of excavators &c. can be readily removed, and in which they are held firmly. As combining beauty and utility these are the nearest to perfection of any instruments we have seen. H.

MONTHLY SUMMARY.

Unerupted Teeth in the Roof of the Mouth—Freaks of Nature.—Sometimes we come across strange freaks of nature, things which border closely on mysteries, and to which it is exceedingly difficult to assign reasons. These things frequently come under the observation of the physician, and quite as frequently do they appear to the observing dentist. As to the truth of the old saying that "Facts are stranger than fiction," I give the following cases as examples: A few months ago a gentleman called to consult me in regard to a swelling in the roof of his mouth, near the median line, which was very sore and painful.

The history of the case, as he gave it, was that about one year previous his artificial set of teeth commenced to rock, and to remedy it he cut out a small portion of the palatal side, which gave temporary relief; when it again would cause him discomfort, then he would repeat it, until he nearly cut through the plate. During all of this time it became more painful, so he could hardly sleep; this was accompanied by a slight discharge. On consulting his family physician, he pronounced it necrosis of the palatine surface of the maxilla bone, but referred him to me. On inserting a small silver probe I felt convinced that it was an unerupted tooth. Acting on this theory, I made a longitudinal incision through the soft parts, and with a straight pair of root forceps got a firm hold and brought it out, requiring considerable force to dislodge it. One of the peculiarities was that it came root downward, and having met with some obstruction was turned nearly at right angles posteriorly, the crown pointing towards the nares; there was some necrosis at the margins of bone, which was easily removed, after which it healed readily, presenting now a normal condition. Considerable hemorrhage accompanied the operation; patient of a bilious-lymphatic temperament; age forty-three years.

I am convinced that this is a case of third dentition, and for this reason: The gentleman has worn artificial dentures about eleven years; for the first seven, a partial plate with molars, bicuspids and one canine. I removed his remaining natural teeth, about four years ago, in order to insert a full denture, and am sure that the centrals were of the second dentition. I extracted them for absorption of the alveolus caused by the partial plate. The tooth being turned at nearly right angles, I think that it must have come in contact with some object before it was thoroughly ossified.

I will give a brief history of another case which came under my notice. A year or so ago a lady consulted me in reference to her plate, which, she said, caused her a great deal of annoyance from becoming loose and not fitting. She said that she had had a number of plates made, and for a time they would fit nicely, and then would commence to rock and trouble her. On making an examination, I thought I discovered the cause in a root, which I attempted to extract, when I found that there was something more. On cutting away the soft tissue, I found the point of an unerupted tooth; but so firmly was it embedded in the bone that I could get no hold of it whatever, so had to cut away a portion of the bone, which was easily done by the burring engine. I was then enabled to get a firm hold, and brought out a fully developed canine tooth one and one-fourth inches in length. It was laying in a nearly vertical position, the crown pointing toward the left, and the root toward the right. These cases are of interest in showing how wonderfully productive nature is in supplying germs of teeth.—*Dr. J. Allen Osmun, in Miscellany.*

Another Discovery.—Prof. Swift, Astronomer of the Warner Observatory, at Rochester, N. Y., discovered another large comet on the evening of October 10th. The fact was noted in the associated press dispatches, but some important and interesting details which could not be telegraphed are herewith given. The new celestial visitor is in the Constellation of Pegasus, right assention, 21 hours, 30 minutes, declination North 17 degrees, 30 minutes. Its rate of motion is quite slow, being in a North-westerly direction, so that it is approaching the sun. It has a very strong condensation on one side of the centre, in addition to a starlike neucleus, which indicates that it is throwing off an extended tail. From the fact of its extraordinary size, we are warranted in presuming that it will be very brilliant, and the additional fact that it is coming almost directly toward the earth, gives good promise that it will be one of the most remarkable comets of the present century. This is the fifth comet which Prof. Swift has discovered, and the increased facilities which Mr. H. H. Warner, the popular and wealthy medicine man, has given him, by erecting a magnificent Observatory for his benefit, promise much more for the future. There is a possibility that further developments may prove this to be the great comet of 1812, which is being constantly expected, in which event astronomers will have an unusual opportunity to test the spectroscope for the first time upon these eccentric bodies, and ascertain certainly what they are.

Behavior of Metals When Heated in Vacuo.—Thos. A. Edison read a paper before the American Association for the Advancement of Science on the above subject, the very interesting results of which we give in a condensed form:

A platinum wire of the five-thousandths of an inch in diameter, and weighing 343 milligrammes, lost, on being kept for nine hours at a moderate incandescence, 42 milligrammes.

By repeating the experiment under a glass shade, the sides of the shade were found coated with a film of platinum.

By varying the experiments he arrived at the conclusion that this effect was due, not to volatilization as commonly understood, but to a wearing away of the surface of the platinum by the impact of the stream of gases upon the highly incandescent surface. This was confirmed by repeating the experiment in vacuo, when the wire could be kept for hours at a dazzling glow without occasioning the slightest deposit on the glass.

By placing a platinum wire, thus treated, under the microscope, its surface will be found covered with innumerable cracks. This cracking is due entirely to the expansion of the air enclosed in the pores of the platinum, and subsequent contraction upon the escape of the air.

By subjecting a wire in vacuo to the electric current, at first weak and slowly increasing, the air will pass out gradually and without explosion. If the wire now be allowed to cool at intervals of fifteen minutes, increasing the current each time, it will be welded together by this expansion and contraction and become homogeneous, and viewed under the microscope will show no cracks, but present a highly polished, silvery white surface. It will be found to be exceedingly difficult to melt in the oxyhydrogen flame, not to be annealed at any known temperature, and give a light eight times stronger than a similar wire of platinum in the ordinary state.

Common iron wire treated in the same way may be made to give a light greater than platinum not treated.

Incidentally Mr. Edison found that the melting point of many oxides is dependent upon the manner of applying the heat.

He further thinks that the volatility of platinum above mentioned might be made use of to coat large plates of glass economically by placing them on each side of a large sheet of the metal kept incandescent by the electric current.—*Druggists Circular.*

Disturbances of Vision Produced by Poisoning from Unsound Meat.—We learn from the Edinburgh *Medical Journal*, for April, 1880, that Prof. H. Cohn, of Breslau, has observed two instances of poisoning, distinctly referable to the eating of game pie and pike which had been kept too long. The symptoms in both cases were severe gastric irritation, with vomiting and faintness, inability to swallow, and paresis of accommodation. In the first case a landlady had attempted to preserve the remains of a hare pie, of which a number of her customers had partaken with impunity. On tasting a small portion of this, some time afterward, she was seized within an hour with the most violent vomiting and other symptoms of poisoning. The next morning she was unable to read, although she had been able to do so the day before. She was first seen by Cohn nine days afterward, when the accommodation was found to be almost completely abolished. She recovered after a month. In the second case three members of a household, numbering six in all, were poisoned, three escaping, although it was ascertained that the symptoms came on after eating pike, and could be due to nothing else. All had, however, partaken of the same dish. On careful questioning it was found that the dish contained two fish, each of which was cut into three pieces, and it was conclusively shown that only those who had eaten the one (which was not perfectly fresh) were affected. In one the paresis of accommodation was the only symptom; the other two had severe gastric irritation besides. In one only the accommodation had not returned when last seen, six weeks after the occurrence. Although a number of instances of fish poisoning are on record, it does not appear that this curious local paralysis has been noted, though from remarks made in some instances, it appears probable that something similar existed. The other symptoms have always been the same. Cohn is inclined to ascribe it to some particular form of decomposition. —*Med. & Surg. Reporter.*

Spence's Metal.—A new metalic compound, which is adaptable to a great variety of uses, and is likely to prove one of the most valuable substances we have, has been lately brought into notice. It is called Spence's metal, and is formed by combining a metalic sulphide—iron pyrites, for instance, or other similar compound—with melted sulphur. The combination forms a liquid, which, on cooling, becomes a solid homogeneous mass, requiring a temperature of only 320° to melt it, and having the properties of expanding on cooling, of resisting atmospheric and climatic influences, acids, alkalies and water, and of being susceptible of a high polish. It is easily prepared for the mold by reason of its low melting point, and gives a nearly perfect cast. The range of purposes for which it may be used, is nearly as varied as that of India-rubber; and it is cheap, costing only one-fourth as much as lead, and demanding only the cheapest processes.—*Items of Interest.*

The Value of Prolonged Artificial Respiration.—The *Medical Press and Circular*, March 31, 1880, informs us that in a recent communication to the French Academy, Professor Fort raises again the question of premature interments. One fact he mentions is, that he was enabled to restore to life a child three years old, by practicing artificial respiration on it four hours, commencing three hours and a half after apparent death. Another case was communicated to him by Dr. Fournol, of Billancourt, who, in July, 1878, reanimated a nearly drowned person after four hours of artificial respiration. This person had been in the water ten minutes, and the doctor arrived one hour after asphyxia. Professor Fort insists also on the utility of artificial respiration in cases of poisoning, in order to eliminate the poisons from the lungs and glands. The length of time it is desirable to practice artificial respiration in any case of apparent death from asphyxia, Professor Fort has not yet determined, but his general conclusion is that it should be maintained perseveringly for several hours.—*Med. & Surgical Reporter.*

Glass Wicks for Lamps.—According to a German trade paper, a new kerosene and spirit lamp has been invented, in which the wick is made entirely of glass. Several advantages are claimed for it. The flame clings closely to the wick, so that lighted lamps may be carried about without fear of their being extinguished by sudden draughts; moreover, no sparks are liberated from it. With an equal amount of this wick turned up, a much brighter and clearer light is obtained than where cotton ones are used. The smoking is greatly reduced, and at least 10 per cent. of oil is saved. There is scarcely any waste of the wick itself, and the troublesome trimming and cutting to which lamp burners are accustomed are altogether needless, for no portion of it is carbonized. Used in spirit lamps it greatly increases the heat of the flame, and finally, it is claimed that it can be produced and sold at a cheap rate.

Anæsthetics in 1651.—The *Lancet* informs us that in a recent work, entitled "Histoire de la Medicine a Troyes," Dr. Guichet relates that the College of Physicians of that town brought an action against a certain Nicolas Bailli for administering internal remedies to his patients and *putting them to sleep.* In defence Bailli declared that having observed that in great operations, amputations, incisions, actual and potential cauterizations, many patients slipped through his hands for want of sleep, he had studied the secrets of nature, and had at last found a cordial, or marvelous essence, which put them to sleep softly, and appeased their sensibility to pain.—*Med. & Surg. Reporter.*

spend most of his time in practicing the operations of filling. He only needs to spend enough time, and under competent instruction and supervision, to acquire correct *habits* of manipulation and a good understanding of the mechanical and artistic principles involved; then if we have such a degree of manipulative aptitude and ingenuity, and of artistic perception as every dentist ought to be endowed with by nature, he will soon become expert in these operations that he must be performing all the time, while the things that he is called upon to do but very seldom must be thoroughly mastered and practiced while a student, if they are ever to be.

The operations of filling teeth are mechanical, and the principles and relations *directly* involved are mechanical and artistic ones. They may be performed with little or no reference to any others, as though working upon a dead body instead of a living person. The man who does so may be a fine, and even artistic *mechanic*, but has little claim to be called a *professional* man.

The principles and relations indirectly involved in consequence of the vitality of the organs to be operated upon, and the mutual relations and dependences between them and the living body in health and disease are recognized and understood so as to guide or modify, or control the operations, in proportion as a man's education and ability enable him to rise above the level of the mechanic to that of the professional man.

So large a proportion of time being spent in the various operations connected with filling teeth, it follows, of course, that success and usefulness *very largely* depended upon the ability and disposition to make thoroughly good fillings. Dentists are entirely isolated from each other during hours, and have few and scanty opportunities to observe each other's methods, or even to talk together about them, and though there is a great variety and a wide range of differences, in the different operations, and the different patients, so that we may say that no two operations are *exactly* alike, yet *practically* we have, after a time, a continual repetition of things we have done before. This makes it inevitable that we shall acquire, after a while, some very firmly fixed *habits* of operating, and get to running in some pretty deep *ruts*. There may be no great objection to this if the *habits* are only good ones and the *ruts* are smooth and free, so as to facilitate easy traveling, but no man has the best methods of doing *all* things, and we cannot be too earnest in endeavors to observe and compare the methods of other men with our own, for the purpose of finding out whether some of them may not be so much better than ours as to justify the trouble of unlearning old ways and acquiring new ones. Most of us are workers and not talkers, and ought to make the special effort necessary to be able to describe an operation minutely and accurately, so that those listening may have in their imaginations an image or picture similar to the one in the mind of the narrator, and not, as is often the case, a very different one. If it were possible, it would prove of the greatest benefit for each of us to become familiar with the habits and methods of a dozen or twenty of the best operators we could find, as a student does with his preceptor. The clinics and discussions at society meetings should be made to all that is possible toward that end.

In filling teeth all points are *special*—that is to say, each step in every operation requires the best attention and most perfect performance that we are able to give it, and some things not mentioned in this paper may be of as much importance as anything in it. When a mouth is presented for filling teeth, it is often desirable, and in some cases indispensable, to clean the teeth before anything else is attempted, and I feel moved to speak just here in emphatic condemnation of the inexcusable negligence of very many dentists in regard to the removal of tartar. It is a burning shame and almost a criminal neglect for any man to dismiss a patient with the implication that nothing more needs to be done, until he has thoroughly removed every particle of tartar that can be removed (unless the teeth were free from it before.) The disagreeableness, difficulty and the small compensation attending this operation are not sufficient excuses for the common neglect to perform it, and very often the service that can be rendered in this way, accompanied by specific instructions in regard to future management in respect to cleanliness, *may* prove of greater service to our patients than all the fillings we may make for them. I have seen the condition and appearance of some mouths totally changed—revolutionized, as a consequence of such treatment and instructions.

The next important step, preliminary to operations of filling, is to make a very careful examination of the mouth, going through it with floss-silk, mouth-glass and small excavators or exploring instruments, tooth by tooth, till the condition of each one is ascertained as nearly as possible with reference to decay, and a permanent record made in a book to be kept for the purpose. Similar cases can be used as in the recording of operations. Doubtful places should be indicated and afterward separated one by one with rubber, or otherwise, for perfect examination with the record book will at any time show what has been done and what remains to do.

The advantages of such an examination are very many. The most important, perhaps, is the opportunity it gives to plan the entire series of operations and arrange the various items so as to be consistent with each other as well as suitable in each instance. The saving of time in frequent re-examinations, and security from the liability to overlook or forget important operations, are of great consequence also. It is a very poor service that a man renders his patients if he only fills cavities that are pointed out to him, without taking much care or responsibility for the entire mouth, and almost all our patients ought to receive just such thorough and comprehensive care and treatment, whether they come in the first place with any such desire and expectation or not. Most of them will be glad to allow it if properly advised, and treated with frankness and sincerity.

The sequence of operations can often be more conveniently arranged if the whole series are presented to the eye at once upon a suitable diagram. It also gives the best opportunity that can be had for estimating the probable cost in the cases when it is necessary or desirable to do so. There are very many people who are unwilling to begin a series of dental operations, as they are obliged to a severe illness, without the remotest idea whether the expense will be nearest to $25 or $500, and there is not often *very* serious objections to giving patients about as much information as we can obtain beforehand ourselves. It will seldom be definite enough to be of much use for "shopping," and of course there is little motive to give prices to those who want them only for comparison with those of other dentists, but those whose circumstances make it really desirable that they should know something about what they will have to pay can usually be told within, say, 25 per cent, the margin varying greatly in different cases. It is not well to do much *guessing*, else we shall get *left* ourselves with too small a price, or our patient will leave for fear of one too large.

Having made the examination and formed the general plan of operations, the next step is to obtain the proper opportunity to work.

This, in respect to grinding surface cavities and buccal cavities consists in little else than the adjustment and retention of the rubber-dam. Patients usually regard the clamp as a barbarous instrument, and its use ought probably to be confined to buccal cavities in the back part of the mouth, and in lower teeth. In these it keeps the rubber from falling against the cavity, giving room to work, and does not strain the corner of the mouth so much as an instrument with a handle, held against the tooth by an assistant. In all the teeth forward of the molars the crescent-shaped instrument held against one side of the tooth is far preferable to the clamp for exposing cavities at the margin of the gum. In all grinding surface cases when necessary, and in proximal ones, when the rubber is liable to slip off from one or both of the two teeth to be covered, the most useful auxiliary that I know is a string of waxed floss with two beads tied upon it. This is quickly and easily tied around almost any tooth (of course *before* the rubber is attempted to be put on,) and its application is seldom more than slightly painful, if at all. It can usually be done even for very small children, and the rubber once slipped over them is in no danger of coming off. In some cases where the adjoining teeth are very close, and they are not needed for *retention*, time can be saved in *adjustment* by tying on the beads, by stretching the rubber down over them on each side, the edges of the hole are held in proper position for readily drawing down between the teeth with the waxed floss. If your assistant is used to it and the mouth is large enough for two pairs of hands to work in, it can be done quicker by one holding the rubber while the other forces it in between the teeth. These appliances, and the orange wood or hickory wedge, for crowding back and retention above the margins of approximal cavities are about all that I have ever found necessary for retaining the rubber dam in any place where I desire to use it. Many small grinding surface cavities in second upper molars and wisdom teeth can be entirely filled in less time than would be required to adjust a rubber dam over them. If a good sized piece of spunk is placed upon the duct of steno, and a napkin laid on a piece of rubber carried into the cheek around behind the last tooth, the finger that holds it in place resting usually on the spunk that covers the duct, the rubber lining will keep the napkin from becoming much wet for a good while. If such cavities are large enough to require a lining of oxychloride of zinc, the rubber should be adjusted upon them in the usual way at almost any expense of time and trouble, *especially if the filling is to be amalgam.* I believe that material is more damaged by a little water than any other with which I am acquainted, and the water is less certain to provide its own remedy by stopping the progress of the operation.

Obtaining the proper opportunity to work in the case of most approxinal cavities consists first in the previous separation of the teeth by means of wood, or rubber, or cotton wedges, and afterward in driving a firm wedge of orange wood or hickory between the teeth close to the gum after the rubber is in place. Those who have not tried it often will be surprised to find how very few cases there are in which it cannot be forced high (or low) enough to expose the margins of cavities extending far under the gum. It will often have to be made thin and bent up (or down) like a bow and carried very near or quite to the process. Patients are very apt, and probably justly, to call these wedges barbarous as well as the clamps, but their great and indispensable usefulness and the lack of any substitute for them, have kept me thus far in the constant use of them. The *previous* separation I regard as of *very* great usefulness and importance in most cases, and I see very many teeth which in my judgment have been injured by the cutting which the want of it made necessary—many front teeth that have been inexcusably mutilated, unnecessarily injuring their appearance beyond remedy. Teeth that have space between them at the necks and touch near the grinding surfaces in a full or crowded arch, so that if cut they will come together and touch again, are often made more certain to decay the second time than the first, by such treatment, the surfaces in contact being less convex and the necks nearer together than before. These considerations are of most importance of course in the cases which do not require cutting from the grinding surface, but they have nearly equal weight when they come to the grinding surface by a small notch, and do not involve a *very* large proportion of the approximal surface. This previous separation is a great deal of trouble, both to the dentist and his patients; and it is only reluctantly, and by experience and observation of its great value, that any one is likely to form the habit of doing it in all the cases in which it is desirable.

I believe myself that it is well to fill a great many small cavities with soft foil, wholly or in part, and to use a great deal of foil without annealing in all cavities which do not require that the finished plug should be a perfectly coherent mass. When cohesive foil is added to soft foil, care should be taken to drive the first portions into the soft foil like a wedge, and not plaster them over the surface, as would be done if the previous mass were cohesive.

A special point about finishing fillings, and one often neglected, is to cut away *enough* of the gold, so that there will be no thin proportions left overlapping the margins (this applies to both approximal and grinding surface fillings,) and it sometimes requires very close scrutiny to determine just when all the overlapping gold is removed, and it cannot be properly done at all unless the border of the cavity has been well prepared in the first place. Then, of course, the work should be left smooth and well polished, if an approximal filling; in grinding surface, if smooth and not overlapping the margins, a *polish* is of little consequence.

Contour fillings, especially corners and sides of front teeth, need very careful attention as to their shape, and the exercise of good taste and a good eye for form. A great many such fillings are greatly exaggerated in size and others are too full in some parts and not full enough in others. I have seen many that were fuller than the original form of the tooth, seeming to say to the eye, "This work is a *little* better than Nature's was. I will therefore show a little more of it and make it generally more conspicuous." Good taste requires that such operations should please the eye by a close reproduction of the original form, a little less than the original in bulk, being of conspicuous color, and at best but an artificial substitute for nature, which should thrust itself upon the attention as little as possible.

Another special point is a retaining point, and which I believe is, in many cases, made too deep and too near the margin, especially if at the cervical wall. The only use of a retaining point deep enough to set a screw in is to have a screw set into it. The principal office of a retaining point or a groove is to hold in place the first pieces of gold packed into it. If they will do that they are usually sufficient for all necessary purposes as dovetails to retain the finished filling. At the necks of the teeth they must often be made with a very small drill, often much smaller than White's No. 1, and the grooves with a *very narrow* chisel and is seldom necessary to cut them deeper than their diameter.

Large cavities, more especially approximal ones in bicuspids and molars, are sometimes left with too deep natural undercuts, and the overhang too frail. Do not be afraid to get a saucer shaped cavity that looks as if a filling would not stay in it, as a consequence of cutting away all the weak overhanging portions of enamel that are reasonably sure to break down and split off after a while if left there. The buccal and palatal walls are especially liable to fail if left too thin and weak. On the other hand, the arch of enamel from the buccal to the palatal walls at the approximal border of the grinding surface, should be sacrificed with reluctance, especially if the cusps are long and the sulci between them deep. It should be retained if there is any probability that it will stand. Undercuts and retaining points, to be of much value or permanence, should be made wholly in dentine and not in enamel.

I think I must have a little to say about amalgam, a material that has been much abused; perhaps the worst abused by some of those who use the most of it. It is my opinion that the proper use of amalgam calls for a higher degree of fidelity and carefulness, and an equal degree of skill and manipulative ability as any material now in use for fillings, but it is very easy to make them so that they will appear well at the time, and yet be so very imperfect as to be in the end of very little use for the preservation of the teeth. There are some kinds of amalgam in common use with which I believe it a physical impossibility to make a good filling, and there are many with the qualities of which I am not acquainted. The same one should be used until perfectly familiar with its peculiarities, so as to be master of its working qualities, for they will not all admit of the same style of manipulation. The cavities must be very carefully prepared, and in almost every instance the rubber-dam *must* be used, for there must be no *chance* of getting moist, unless in the forlorn cases where a *good* operation is out of the question. The materials should be quickly and thoroughly mixed in just the right proportions, and will be so dry and powdery as to be a nuisance to get where it is wanted in many cases. It must be *packed* in small quantities and with points that will condense it well into corners and undercuts (a small ball burnisher is best in places where it will go.) It sets so fast that two mixings will often be necessary in places where it is difficult to carry it to its place and the filling is large. It must be packed and worked together solidly throughout, with much the same force as is used for condensing by hand the surface of a soft foil filling. If dry, as it should be, it is very difficult to build up a corner with it, and in most compound fillings a matrix should be used. One is easily made by bending slightly, if necessary, a piece of separating file and pushing in a wedge of soft wood behind it, or a piece of sheet lead may be bent around one side of the tooth across the cavity and held by ligatures. Twice the time will be saved that it takes to adjust them and better work can be done and a more satisfactory contour obtained. They can be immediately removed and the filling trimmed to very nearly its final form. It is indispensably necessary that every amalgam filling should be polished at a sitting subsequent to its insertion.

It is impossible to deny that amalgam fillings *can* be made in the way I have indicated so as to be thoroughly good operations, in the same sense and for the same reasons that well made gold fillings are good operations. The characteristics that make them so may be described in the same terms, that is, they will not leak; they will take and retain a smooth surface; they will make a smooth margin that will not crumble. The difficulty of doing good work with amalgam often increases with the smallness of the cavities if approximal ones, and I believe that most approximal cavities not reaching the grinding surface, if of sufficient depth and having good walls, are better filled with tin foil than amalgam. If Williams' tin cylinders are used, of style B, which are rolled pretty hard, a little practice will enable one to make them in many cases as quickly and easily as with amalgam, and with the advantage of finishing at once. There are many places, especicially in young or soft, teeth in which I question whether gold will make as useful a filling as tin. The range of applition for tin is quite limited, but within its proper limits I believe it one of the most useful materials we have. The great convenience of these tin cylinders, and the fact that they appear to be but little known or used, are perhaps sufficient reasons for directing your attention to them particularly. The tightly rolled ones, style 1 B, and 2 B, can be used in about the same way as folded pellets of foil, and by spliting them lengthwise with the scissors as small pieces as are desired can be easily obtained. Tin is practically non-cohesive, and one who never makes a gold filling without lighting his annealing lamp, will be likely to deed a little practice before acquiring facility in its use. Every piece, even to the very last, must go deeply enough into the cavity to be retained by wedging, but it is considerably softer and more easily wedged tight than gold; the surface condensation will take effect more deeply, and it is far more rapidly and easily trimmed and finished.

I am not one of those who desire to see the use of amalgam increased, but I wish that men should feel as much under obligation to maintain a high standard in their operations with it as they do in their gold operations, and to keep them as carefully under the supervision of their consciences and their professional pride. If that is accomplished, amalgam fillings will be found less remunerative than gold ones, and so the motives of self-interest will be on the side of the better material. I believe that such treatment of the "amalgam question" will do more toward restraining and diminishing its improper use than the wholesale and unseasonable denunciation that we sometimes hear.—*Ill. State Dent. Society Trans.*

ARTICLE II.

Carbolic Acid and Creasote—Their Chemistry and Therapeutical Application to the Practice of Dentistry.

BY TRUMAN W. BROPHY, M. D., D. D. S., CHICAGO.

There are no remedies mentioned in the Materia Medica, so extensively used in dentistry, as the ones I have selected as the subject of this paper. Therefore, I believe, we can occupy our time in no better way than to examine their merits, as well as to consider where they are indicated, and how they should be applied. Let us first look into the chemical composition of these substances and then speak of their medicinal properties. Carbolic Acid has for its formula, $H_2 C_6 H_4 O$. Carbolic acid is known by the names of hydrate of phenol, $C_6 H_5 A O$, phenic acid, phenic alcohol and phenol. It is only slightly soluble in water, forming *aqua acidi carbolici* of the U. S. P., but it dissolves readily in alcohol, ether and glycerin. When liquefied by heat, or by five per cent. of water, it resembles creasote, and is very frequently substituted for it.

Coal tar oil, besides furnishes carbolic acid, or hydrate of phenol, contains cresyl, hydrate of cresyl, or crsylic acid $C_7 H_7 H O$. While wood-tar oil contains guiacal, C_7

$H_8 O_2$, also $C_8 H_{10} O_2$, or the creasote with which we are all so familiar. Carbolic acid may be distinguished from creasote by the following tests: Carbolic acid boils only at 370° F., while creasote dries up at 212°. Carbolic acid is either solid, or may be rendered so by subjecting it to cold; creasote cannot be solidified by the cold produced by a mixture of hydrochloric acid and sulphate of sodium. Carbolic acid is soluble in a large volume of water (about 1 in 80 or 1 in 20, of boiling water.) This solution is colored blue by a neutral solution of feric chloride, while wood creasote is less soluble in water (1 in 129) and has not a blue color imparted to it by feric chlorid. An alcoholic solution of carbolic acid is colored brown by feric chlorid; a similar solution of wood creasote, green. Carbolic acid forms a jelly when shaken with collodion; not so with creasote. There has been considerable discussion on the subject as to whether carbolic acid is a *true* acid. While it does not color blue litmus paper, red, this failing to respond to the usual test for acids, we know that it unites with basylous radicals, forming carbolates, therefore it is an acid.

There is much in the literature of dentistry on the use of carbolic acid and creasote; there seems to be an almost universal preference shown for the latter. Carbolic acid has entirely superseded creasote as a remedy in general medicine and surgery, and I believe there is no sufficient reason for placing it second to creasote in dental therapeutics. Why creasote is preferred to carbolic acid by dentists, is indeed difficult to understand. A disposition on the part of members of the profession, however, to accept the method of their predecessors, may be an explanation of the views held by so many in regard to these agents. Since carbolic acid is equal and perhaps superior to creasote, as a therapeutical agent, I shall speak of it hereafter, and shall insist that its action is identical to that of creasote when of the same strength, and their strength is determined by their power to coagulate albumen. Of twenty-five scruples of creasote purchased from as many dealers, including dealers in dental goods, I find on examination that all, with but one exception, contains carbolic acid—the one which is free from carbolic acid was imported and sold to me by Gale & Blocki, of Chiago. Those, therefore, who supposed they were using creasote have employed either carbolic acid or a mixture of this acid with creasote. Carbolic acid is soluble in water only in proportion of ninety-five per cent. of carbolic acid to five per cent. of water, and in any proportions stronger than that; also in the proportion of ninety-five per cent. of water and five per cent. of carbolic acid or any solutions weaker than that. It is impossible to dissolve carbolic acid in water alone, in any other proportions than the above. If, however, we add glycerine or alcohol to the water we may make it of any strength desired. We hear of ten per cent. solutions of carbolic acid and water—this is an impossibility.

I cannot illustrate the views held by me in regard to the use of remedies more forcibly than by quoting the words of a distinguished physician, and one whom you will recognize as reliable authority on all matters pertaining to medicine. I refer to Prof. J. Adams Allen, who in his open lecture on general therapeutics, at Rush Medical College, said: "We must trace out an essential relation between our therapeutical agents and the changes produced by disease, in order that we may intelligently apply the former to the latter. But if we cannot establish this relation, we must throw our agents aside as useless. Because Drs. A, B and C have used a certain remedy in certain diseases, a certain number of times, and their patients have recovered, it is not proof that it was the result of using that particular agent. We must prove that there is a relation between the remedy we use and the disease for which we employ it. *Disease* is change of structure of a part from a normal standard. A remedy is an agent which restores the part to its normal condition, no matter *how* it does it, so it is *done*, but in the first place we must ask a question: ***What's the matter?*** What material change has taken place, how can we restore it to its normal standard? How can we bring it back? Anything that will do that *is a remedy*; if it does not, it is *not*. If it aggravates the conditions existing, it is a *poison*, that's all."

There is sufficient in the foregoing remarks to guide us, keep us in the right path, and prevent us from misapplying remedies the properties of which are so clearly set forth in our works on therapeutics. Is carbolic acid so used, especially when applied to exposed pulps, that it will restore them to their *normal standard?* Let us see. In the first place it is essential to know the action of this agent when locally applied. Carbolic acid coagulates albumen, and dissolves into volatile and fixed oils. It is an escharotic, leaving a white eschar which soon turns brown and is cast off. Carbolic acid is an anæsthetic, acting with wonderful promptness upon the part to which it is applied.

Dr. J. H. Bill states in an article published in the *American Journal of Medical Science*, that "by applying carbolic acid to the integument, insensibility to pain may be sufficiently induced to permit free incisons without suffering." The escharotic action of carbolic acid contraindicates its use as an application to exposed pulps, the vitality of which we endeavor to preserve. If, however, we make a solution from one to five per cent. we have an excellent remedy, slightly stimulating and antiseptic, which may be applied to an exposed pulp without fear of causing a slough and subsequent death of the whole part. I desire, gentlemen, to repeat what I stated to you three years ago, to wit: That I regard it bad practice to apply an escharoitc to a pulp, the vitality of which may be preserved by proper treatment. Carbolic acid or creasote, therefore, if used in contact with exposed pulps, which we subsequently cap, must not be stronger than a five per cent. solution. Carbolic acid has been very successfully used to arrest nausea and vomiting. From one to two drops in a glass of water will usually accomplish the result desired.

Since carbolic acid has the power to arrest suppuration, and to promote healthy granulations, it is invaluable in the treatment of alveola abcesses, apthæ, ulitis, stomatitis, phagedena, papilloma; epithelioma, schirrous, cauliflower growths, etc. In the treatment of the above diseases, the agent should be of such strength as the requirements of the case indicate.

Carbolic acid *is a powerful* antiseptic, but *is not*, as many well-informed members of the profession believe, a disinfectant. Carbolic acid *has* the power of preventing decomposition (hence *it is* an antiseptic), but *has not* the power to destroy or render inoffensive the products of decomposition; therefore it *is not* a disinfectant.

Owing to the erroneous impression as to the properties of carbolic acid, it is used to the detriment of patient and practitioner in the treatment of many lesions. Carbolic acid is an irritant poison. Although an escharotic it diffuses into the blood rapidly. If carbolic acid has been taken in toxic doses, liquor calcis, saleratus or oil is the antidote. When it is found necessary to devitalize a pulp, the anæsthetizing properties of undiluted carbolic acid make it desirable as a dressing previous to the application of arsenious acid. There are other remedies, however, equally as efficient. Carbolic acid is the most satisfactory agent to obtund sensitive dentine without endangering the vitality of the pulp, with which I am acquainted. Carbolic acid may very properly be applied to the canals of teeth immediately after extirpating their pulps, but if the pulp is putrescent it is not to be used; since some form of chlorine is the agent indicated with which to disinfect the parts.

Carbolic acid as well as creasote, are flesh preservers; indeed, the word creasote is derived from two Greek words, *Creas*, flesh, and *Sotal*, I preserve—flesh preserver. It preserves flesh, however, not as is frequently supposed, to wit: by preventing vital soft parts from losing their vitality, but by preventing non-vital tissue from becoming putrid and disintegrating. Carbolic acid is a most excellent remedy to apply to carious teeth during the process of excavating, to enable us to more clearly see the extent of the caries. In many cases where we have adjusted the rubber cloth and excavated the cavity in the most skillful manner, we are suprised, upon moistening the cavity and its surrounding surfaces with carbolic acid, to find carious tissue, which if permitted to remain, would soon render another operation necessary, in arresting the progress of disease. It a few drops of carbolic acid be added to sandarac varnish, which we use for moistening cotton for the temporary sealing of cavities, it will prevent decomposition of the secretions which accumulate about the cavity and the cotton will remain tree from offensive odors much longer than it otherwise would. Carbolic acid is most destructive to the lower forms of life. These minute organisms so frequently found in the oral cavity and in carious teeth cease to exist when very dilute solutions of this agent are brought in contact with them! "As all fermentations are correlative of the growth and multiplication of these minute bodies, carbolic acid, by destroying their activity, arrests zymosis." A solution, one per cent. in strength, according to Dr. Isador Neumann, is sufficient to destroy bacteria, vibrio, etc. Much more might be said in regard to the use of carbolic acid in dentistry, but I shall detain you no longer. I hope there may be untiring research without prejudice, by the members of our profession, as to the action of remedies, so that we may soon say that empiricism has yielded to the higher, more reliable and satisfactory methods, based upon the grand, broad, beautiful and universal truths revealed to us through the instrumentality of science.

After reading his paper Dr. Brophy exhibited the collodion test for distinguishing carbolic acid from creasote.

DISCUSSION.

Dr. Cushing:—I have procured an article of colorless creasote from Sargent, imported by him which he believes to be pure.

Dr. K. B. Davis:—I have found carbolic acid to be much more escharotic than creasote.

Dr. Brophy:—I agree to that, but claim that creasote has no properties not possessed by carbolic acid of the same strength.

Dr. Spalding:—What is the standard of strength since creasote and a 95 per cent. solution of carbolic acid are not of equal strength? The experiment of coagulating collodion is merely for identifying them, and is not a test of relative strength.

Dr. Kulp:—What are the comparative merits of the two for the treatment of abscess as shone by experience? That may perhaps throw as much light upon the question of their relative strength as a theoretical examination.

Dr. Harlan:—I wish to correct one error in the paper. Carbolic acid in full strength is not an anæsthetic. That property is only developed by dilution and evaporation. Pure wood creasote reddens litmus paper and does not coagulate albumen to anything like the same extent as carbolic acid, and is much inferior to carbolic acid for use in practice.

Dr. Brophy:—A 95 per cent. solution of carbolic acid is anæsthetic.

Dr. Hurtt:—I have often verified the statement of the paper as to the anæsthetic properties of carbolic acid by using it for that purpose in making incisions into abscesses.

Dr. Talbot:—The same thing is shown in the old method of capping exposed pulps by bathing them with carbolic acid or creasote and covering with oxychloride of zinc. The severe pain which the contact of the chloride of zinc would otherwise cause, being prevented by the anæsthetic effect of the carbolic acid.

Dr. Crouse:—The chloride of zinc does not come in actual contact with the pulp on account of the coagulum or eschar between, which was made by the carbolic acid, and I think that accounts for the absence of pain rather than any anæsthetic effect of the carbolic acid.

Dr. Talbot:—The chloride of zinc would penetrate the coagulum and still produce pain except for the anæsthetic effect of the carbolic acid.

Dr. Black:—I do not believe that chloride of zinc will penetrate a coagulum, but in many cases an application of creasote or carbolic acid does not reach actual contact with the pulp. If it can be made to do so, and forms a *complete* eschar over the entire exposed surface of the pulp, there will then be no pain from the chloride of zinc, but that is often a very difficult thing to do.

Dr. Hurtt:—There are many young men in the state who have been led into difficulty by the statements made in the society, in former years, about capping pulps with oxychloride of zinc without pain—*without* the warning that Dr. Black has given of the difficulty there is in making the preliminary application of carbolic acid complete and effectual. In one instance I filled a cavity in which there was an exposed pulp (in grinding surface cavity in lower molar,) full to the brim with carbolic acid and left it there for fifteen minutes, and then capped it with oxychloride of zinc without wiping away quite all of the carbolic acid; but after ten or fifteen minutes there was excruciating pain, which required two hours to relieve, after removing the oxychloride of zinc, and which the patient remembers with ill feeling toward me to this day.

Dr. Harlan:—When the pain in an exposed and inflamed pulp is relieved by an application of creasote or carbolic acid, it is not the anæsthetic effect of the application that stops the pain, but it is the exclusion of the air and other irritants from contact with the pulp by the eschar which the applicatian produces, and anything that can get through the eschar may produce pain.

Dr. Brophy:—Will *any* escharotic have the same effect in quieting the pain?

Dr. Harlan:—Some escharotics will not act in that way, but will increase the pain and irritation.

Dr. Brophy:—I insist upon it, that it is the anæsthetic effect of the carbolic acid application which relieves the pain in these cases.

Dr. Taylor:—How long will the anæsthetic effect of the application last? I believe that the carbolic acid has some effect upon the circulation which prolongs the relief from pain.

Dr. Black:—What has been said about the difficulty of obtaining a *complete* eschar would lead any one to be careful, and not be surprised if there were pain in some cases.

Dr. Hurtt:—Pain will ordinarily be prevented if the slab on which the oxychloride is mixed be warmed, and the material mixed as thick as it can be handled without using pressure upon the pulp.

Dr. Harrison asked Dr. Black the difference between carbolic acid and creasote for the treatment of abcesses.

Dr. Black:—I think them alike—if I have had any creasote that was free enough from mixture with carbolic acid, to afford me a fair comparison.

Dr. Brophy called attention to the statement that an escharotic should never be applied in direct contact to an exposed pulp.

Dr. Black:—I made the same assertion at the previous meeting of this society in Bloomington (ten years ago), and I still believe so. In a paper at that time I gave a record of ten years of indiscriminate capping (with oxychloride of zinc,) and followed by general failures (as was characteristic of the general practice of that time,) but I believed then and now that capping with oxychloride of zinc is good practice in *selected* cases.

Dr. Sturgiss thanked Dr. Brophy for his efforts and investigations in regard to the subject.—*Trans. Ill. State Dental Society.*

ARTICLE III.

Mechanical Dentistry.

BY E. M. FLAGG, D. D. S., NEW YORK.

(Read before the Connecticut Valley Dental Society.)

It has become to-day a very important question for our profession to decide, whether celluloid is to be a failure or a success as a dental plate. Of late there has existed a strong disposition on the part of many members of the profession to evade the subject of artificial dentistry, or ignore it entirely. Its discussion has been more or less excluded from dental associations, and in some cases motions have been made to deny it a position altogether as a branch of dentistry. One might almost suppose, to hear certain gentlemen speak of artificial dentistry in the manner they do, that they had so far outgrown it, and it had become a matter so simple and all its requirements had been so completely fufillled, that mental energy bestowed in that direction was a mere waste of brain-power. I claim the contrary. Its requirements have not been fulfilled. An artificial denture is supposed to represent the natural organ in a manner that its expression, character and effect will harmonize with the individual for whom it is made. In other words, that it will be an exact portrait of what the patient's teeth would have been had he preserved them in health to the time when the artificial substitute was inserted. There are many gentlemen in the profession who are wearing artificial dentures, and judged by the test just named there is not one denture in ten but that could be picked to pieces by perfectly legitimate criticism. So much for the requirements of artificial dentistry having been fulfilled. Remarks in this direction might be continued indefinitely.

The necessity for a higher standard of artistic culture in this direction cannot be ignored. It is useless to prate about the number of teeth that are being saved annually.

That does not help those who have lost their teeth one particle, and we all know it is no uncommon remark on the part of patients, that it is impossible to make a set of artificial teeth like natural. So far as rubber is concerned this remark is true. You cannot get individuality from a row of moulded porcelain blocks. As well might you expect an artist to make a portrait by selecting from a quantity of manufactured noses, eyes, ears, etc., and joining them together on a canvass. To obtain individuality in work the artist must not be restricted in his ability to arrange any portion of the material which he uses in any manner that he may desire. He may take a single plain tooth and carve and polish it in any form he desires, provided the material be sufficient; but a moulded block, as it comes from the manufacturer, cannot be made by any amount of artistic manipulation to alter its rigid, lifeless expression. So far is this assertion true, that I have had agents of dental depots tell me that they could always detect whether the wares exhibited in the mouths of those they met while traveling were from the moulds manufactured by the house they represented or not. What a comment to be made in a country where our profession is supposed by some to have reached the highest plane of development!

Celluloid has not this defect named in connection with rubber. Single, plain teeth can be used, and the artist is not restricted in giving the highest expression and character to his work. If we appreciate the requirements of his case there is nothing to prevent him from fulfilling them if he uses celluloid; so I say again, that there is no question so important for the profession to decide as whether celluloid is to be a success or a failure. The defects found to accompany the use of celluloid are as follows: (1) A wrapping of the material either in the process of moulding the plate or soon after the plate is inserted. (2) Discoloration of the material around the necks of the teeth, soon to be followed by discoloration of the entire plate and subsequent softening of the plate. (3) After sufficient softening the plate itself often breaks, which breakage is assisted by the disposition of the material to warp, and the teeth are inclined to drop off by the celluloid shrinking from the pins and the softening of the material around the pins.

The plate at first introduced itself upon the notice of the patient by a constant taste of camphor in the mouth, and to some patients this effect is very dispiriting, but as the plate becomes discolored and softened, the taste and smell of the celluloid is disgusting in the extreme, and the patient is inclined to condemn a material whose sole defect may lie in the manner in which it is worked. If we go on working it in the manner which we have been taught, celluloid is to be a failure, because there has been no apparatus that will fulfill the conditions required to the production of a perfect plate.

These conditions are as follows: (1) No steam, oil, or other foreign substance must be allowed to come in contact with the material while it is plastic, or it will discolor. (2) During the process of pressing the celluloid one portion of the blank must not be one degree colder than another portion, or it will warp. (3) The material must have its form changed at a heat much higher than is now used, otherwise it will still have a tendency to return to its original position, or, in other words, warp. This superior heat must be obtained in an apparatus that is airtight, for if the superheated material can obtain oxygen either in the form of vapor or a current of air, it will surely burn.

Let us now briefly consider the various apparatus that have been used for working celluloid and we shall see how unfit they are for producing a perfect plate, or if capable of producing good results, we shall see how the labor required will render them impracticable to the mass of the profession.

First, we have the glycerine machine, that produces a plate in which the celluloid had the benefit of a good soaking in this greasy, penetrating compound while the celluloid was in a softened condition, and the pins of the teeth had the additional advantage of being well greased, which left them in a condition admirably adapted to facilitate their future exit from the plate.

In the second place, we had the steam machine, with no thermometer and a valve in the place of it. Our experience with this instrument was that it produced a plate whose texture was not in any way improved by a volume of overheated steam rushing through it while in a plastic condition, and the contact between tooth and plate was anything but perfect. The plaster cast was often softened to such a degree by the hot steam and water that the fit of the plate would be destroyed. The investment would also soften to such an extent that the articulation would be badly impaired. The plunger, running in a steam packed cylinder, always left us doubtful as to whether the plate or the rubber of the cylinder was making resistance to our pressure, while such a thing as getting a fine dense texture to our celluloid was entirely out of the question. In fact, to enumerate all the defects of this instrument (so much vaunted by the Celluloid Company) would require more space than can be allowed to this entire article.

Another machine had a limited sale and was known as the Heintzmann dry oven. It purported to press celluloid at a dry heat, and was furnished with a large door, the opening of which served the double purpose of allowing the flask to be seen and the cold air at the same time to enter the flask. It also enables the operator to get one part of his flask very hot while the other remained comparatively cold, and it was with the greatest ease that he could burn one corner of his plate while the other remained so cold that the material would hardly flow. These bad results would be in part due to the misguiding influence of a thermometer that was placed on the top of the machine, which could only register the heat of the iron walls of the heater, and as the burner heated the iron walls and the flask was the last thing to receive heat, the thermometer was therefore of little use.

The fourth machine is known as the "Best," and although far better results could be obtained with this instrument than any of the others we have mentioned, there is probably no other machine that produced so many failures. "Dry, moist air" was not so bad as superheated steam for the texture of a celluloid plate; but any moisture is bad coming in contact with celluloid in a plastic state. It prevents elimination of whatever is volatile in the material, so that the material does not attain a good degree of hardness and cuts under the instrument in a manner known as cheesy. Perfect dryness of the flask is eminently desirable, and this cannot be satisfactorily obtained where there is any unevenness in the application of heat to the flask. Unless the heat is perfectly uniform the plaster is liable to powder and to crack, and becomes unfit for an investment.

In the Best machine, by constant watching and shifting the upper for the lower half of the flask continually, so that they would be alternately presented to the bottom of the oven, we might obtain a comparatively even heat. The directions said, "Wet the finger and touch the heated flask, as a laundress does a flat-iron, in order to see to what extent it would 'fiz.'" This primitive operation was supposed to serve the place of a thermometer and indicate the heat of the flask, but I have to record it as my experience that it was a very unreliable "thermometer," and I doubt that if all the evidence could be collected upon the subject of "finger fizzing" (or flask fizzing), it would lead to results sufficiently certain to warrant its use in the working of a substance so sensitive as celluloid is.

So much for the apparatus heretofore used, and if celluloid were dependent for its success upon the machines mentioned we should not have long to wait before it would be generally given up as a failure. A few men of the profession who could give their labor to celluloid as a specialty would have more or less success, but the mass of the profession in the smaller cities, who have to divide up their time between both branches of our specialty, would not and could not afford to give their attention to a material whose best results were attended with uncertainty. For the most part they do not get large fees for work, and failure is with them a very serious consideration. They cannot afford to calculate upon making over plates again. The manufacturers cannot afford to bestow the same expense in the perfection of the "blanks" if their sale is to be narrowed down to a few specialists. Celluloid, as a material, has every advantage that can be hoped for. "Rubber" is known to be unfit for contact with the mucous membrane of the mouth, and "rubber poisoning" is familiar to nearly every dentist. Those who use rubber are victims to a restrictive monopoly. And yet there are probably fifty rubber plates made to one celluloid, and this proportion in favor of rubber will be greatly increased when the license tax upon it is removed.

I have said that celluloid, as a material, is the best that can be used in the mouth, and we will now describe an experiment to prove the truth of the assertion. Take a celluloid blank from the dental depot, say number six and a half full upper (this number covers as much surface as any,) pour plaster inside of it, making a model for the blank to rest upon. The blank will fit the plaster model, with the exception of the slight difference to be expected from the "setting" of the plaster. Now, if we keep the blank and the plaster model for six months or a year there will be no change in the fit. The Celluloid Company have not boiled the blank in grease or glycerine. They have not subjected it to a current of superheated steam, nor have they cooked it in an oven that would heat one part of it more than another. We may take the same blank and put it in soak in the promiscuous contents of our saliva-pump, and there it may soak for six months at a temperature of 100°F. with no change to either color or form. We will now take another blank and mould it in the steam heater upon a plaster cast. We will not put any teeth on it. As our plaster cast will be probably destroyed in the process of pressing, we shall have to make another one to preserve for the purpose of our experiment. The first effect we note is that our steam-moulded plate will smell strongly of camphor and cut under the instrument in somewhat the manner of hard cheese. In about three days the smell of camphor will have left the piece, and while we congratulate ourselves on that effect there will be another effect upon which we cannot congratulate ourselves, and that is that the steam moulded piece of celluloid will not fit the cast at all. So much for the effect of steam upon the fit. If we now take our steam-moulded piece of celluloid and put it in soak in the contents of the saliva-pump, we shall find that in one week it will begin to discolor, and in a month will present an appearance as disagreeable as bow-spring rubber.—*Dental Miscellany.*

ARTICLE IV.

The Preservation of all the Natural Teeth.

BY JOHN T. CODMAN, D. M. D.

Whatever I may present on this subject must be in the nature of hints rather than generous display of knowledge, and no attempt whatever will be made to cover *all* the ground that might be occupied to advantage. I promise to be brief and not trespass too much on the reader's time.

I take the ground that we as dentists should try to preserve all the natural teeth, and that this is our first duty.

Two professions at least should have something to say of the relations of the teeth to the system, to the health of the human body. These professions are represented by the man of anatomy, physiology and hygiene, and the dentist. The first should by the study of these kindred sciences be able to determine accurately the true physiological and physical conditions that must of necessity produce, develop and preserve teeth of fair structure. A study of these conditions will require a life time—must be continued from generation to generation until they are thoroughly understood and perfected. As to the second, the dentist, it is well that he should know all that the first knows or can know of these subjects, but this cannot be expected. The dentist's art absorbs his time and energies. The study of materials, the exercise of mechanical dexterity, and the daily toil for sustenance gives him enough to do as a dentist, without trespassing too far on ground that belongs more properly to another.

Now 1 know the reader will think it presumptous in me to propose to save all the natural teeth, and yet I think that to be our duty and no more than we should all strive accomplish. I grant that there are exceptions. As a sensible man I admit them, but these exceptions, to a student of dentistry, grow less and less as time and study go on. Dr. Flagg's "unbroken arches" will not in the future be such fabulous things to us or to a majority of the profession, who can hardily now beleve his statement a truthful one. I certainly can believe it not only possible, not only probable, but certain that with right materials, rightly used, thousands of teeth that to-day we are called upon to extract, may be preserved to a "good old age."

Then why are they lost? Simply because we are too ignorant to save them, or because we do not make the attempt. What is the condition of the teeth we are called upon to extract? In general, they are aching teeth, broken down teeth, or loose teeth. The greater portion are aching teeth, aching from inflammation of the pulp. This comes from various causes, such as disturbed constitutional conditions, stomachic, nervous, or otherwise. If these are reduced the pain disappears. If the pulp regains its health the tooth may be preserved. If the pulp is discased it may be destroyed, the root treated, and without a great deal of labor the tooth saved for years. Another portion are abscessed teeth. If the abscess is slight, proper treatment will reduce it. If greater, then with right treatment the abscess will become benign and the tooth and surrounding parts return to the normal condition, with the possible exception of a fistula that may heal after a while. Broken down teeth and roots deserve more thought and care than is usually given them. Why extract such when they are not troublesome? This always produces shrinkage. When taken out, the arch that should be kept full is broken, and a thin look of the features with sunken cheeks is the result. Clean them, fill them with some of the plastic fillings, such as gutta percha, amalgam or oxychloride of zinc, if not with gold. Loose teeth may be preserved often times for years even when they seem hopeless; I know it for I have proved it. This is not theory; it is what I have learned, what I try to do and accomplish in my practice.

If looseness is not occasioned by tartar, some other condition will be found that has raised the tooth or lowered it from its place in the socket. The strain produced by the closing of the jaws causes the foward and backward movement of this particular tooth and increases the tendency to elongate. The remedy is simple. File off the elongated tooth until free from its opponent. If necessary take some off its mate in the other jaw. In this way return it to restful conditions and let nature finish the work. She will accomplish more than many give her credit for.

But in this connection comes a matter of greater importance, and one on which I may find more disagreement than on any other point—the extraction of the sixth year molars to make room. I disagree with many on this point and adhere to the proposition, long since advanced, that the extraction of teeth from either jaw produces a narrowing of the arch. It cannot be otherwise. Then how do you gain room by so doing? That we gain more room for teeth that still remain may be true, but I maintain that we have no right to extract for that purpose, except in very rare cases. "But," say some, "they are poor teeth and we cannot save them." If you cannot save them—if you cannot save teeth then do not call yourself a dentist. "But," say they "if I take them out I prevent the other teeth from crowding, and crowding is what makes teeth decay." Is it? Let us see. When I am shown an old person with sound teeth, or reasonably sound teeth, not close together nor crowded, then I may believe; but my experience is that no person of, say seventy years, can show a set of natural teeth unless such teeth are close together or crowded to lapping.

I could continue to write in this way, but do not wish to; but I ask why the lower animals have good teeth and the human animals poor teeth? And asking this question brings us at once to the "acid theory"—the theory stands better than any other. Sour mouths, sour stomachs, sour breaths, and I may add sour dispositions, are consistent with rotten teeth, slimy mouths *ad nauseum*, getting the better of tooth brushes, washes and tinctures every time.

Let us be radical as well as sensible and say what we ought to have said a thousand times: *The best diet of man is that which keeps his teeth clean and preserves them from decay.* As we are not physiologists, we do not know andh ave not studied the question of diet. We turn to those who have, to aid us, and demand of them to show us a diet that will meet all desired conditions. Let this be done and our work will stand, our fillings stay, and however crowded the teeth may be, such teeth will remain sound. I for one beg of any one to let me know and let the world know why I cannot have a diet that will keep my teeth as sound as those of the horse, as white as those of the dog, as clean as those of the cat. We as dentists will promise to double our zeal, to give our mechanical aid, our professional skill, as well as our hearts to our part of the problem if others will but do their duty by the part left to them.

In conclusion, I wish to say that sufficient attention has not been given the fact of the alteration of the shape of the face and the tones of the voice by the loss of the back teeth, and by the non-development of the dental arches. One of the great Italian writers on music says: "You cannot be a good singer unless you have all your teeth," or words to that effect. I wish this were inscribed in every household where the love of harmony exists. It is only by the development of all the teeth that the mouth is formed for harmony. Only by the development of the jaw, produced by the presence of wisdom teeth, is the uvula and the soft palate lifted out of the throat to its proper, harmonious place. Looking at the subject in this light, let us be more cautious how we extract teeth—more careful and persistent in our efforts to preserve them.—*Odontographic Journal.*

ARTICLE V.

Lectures on the Physical Examination of the Mouth and Throat The Physical Signs Derivable from the Breath, Lips, Teeth and Mouth.

BY G. V. POORE, M. D., F. R. C. P.

Professor of Medical Jurisprudence, University College; late Assistant Professor of Clinical Medicine; Assistant Physician and Physician in Charge of the Throat Department of the Hospital, etc. Delivered to the Junior Class of Clinical Medicine, University College.

Gentlemen.—It is my duty to bring to your notice the various physical signs of disease which are to be obtained from an examination of the throat and windppie; but inasmuch as it is impossible to properly examine the throat without at the same time examining the mouth and nose, I think I shall be best fulfilling my duty by dealing methodically not only with the throat, but also with the oral and nasal cavities which lie above it.

The physical signs met with in these regions of the body appeal not only to the sight, touch and hearing, but occasionly to the sense of smell as well; and the first thing which forces itself on our attention is often the odor of the breath.

The *smell of the breath* is a valuable physical sign, and in many diseases is so characteristic as to enable the man of experience to form a diagnosis from it alone with almost absolute certainty. It is impossible to describe the various odors of the breath: experience alone will enable you to distinguish one from the other, and I shall merely content myself with catalogueing some of the most distinctive of them. The smell of drink is the most common of all, and in case of insensibility is often a valuable indication of the cause. It may give a valuable hint as to the habits of the patient; and I would here remind you that over-indulgence in alcoholic liquors is one of the most common causes of congestion and catarrh, both of the pharynx and larynx. You must not run too quickly to the conclusion that because a man's breath smells of drink he is necessarily a drunkard, for a single glass of wine or beer is sufficient to impart an odor to the breath for some time after it has been taken. When directing attention to the alcoholic smell of the breath in the presence of the patient, I am in the habit of speaking of it as *osnosmia* since patients naturally resent having attention bluntly called to the fact that they smell of drink.

The presence of carious teeth imparts an odor to the breath which is quite characteristic, and which, according to Mr. Salter, resembles no other odor except that given off by the genus of neuropterous insects called Chrysopa. Want of attention to the mouth and allowing food to lie between the teeth and decompose, or the presence of decomposing matters in the crypts of the tunis, imparts a foul odor to the breath. A disordered stomach also causes the breath to be fetid.

A peculiarly disgusting and characteristic odor of the breath is present in those cases of chronic inflammation of the nasal and pharyngeal cavities, which are known from this fact as ozæna, and which are most often due to caries or necrosis of the nasal bones, which is generally of syphilitic origin. The smell, however, may be present without any disease of the bones in case of chronic inflammation of the cavities occuring in scrofulous subjects.

In cases of dilatation of the bronchial tubes accompanied by ulceration and copious purulent discharge, the smell of the breath is peculiar and almost diagnostic of the condition, and in gangrene of the lung the odor of the breath reaches a degree of foulness which, once smelt, can never be forgotton.

In cases of fever with high temperature, a dry mouth, and the accumulation of sordes on the teeth and gums, the smell of the breath is peculiar. In pyæmia and in diabetes the breath has a sweet odor, but the odor in each of these diseases is perfectly distinguishable.

With inflamed gums the breath is apt to smell. This is peculiarly the case in patients under the influence of mercury, and the term mercurial odor of the breath is one in common use. In scurvy, the breath is apt to be very foul. It is needless to say, that certain articles of diet, as garlic and onions, and certain drugs, as turpentine, copaiba, and some of the essential oils, are detectable in the breath.

The *inspection of the lips* is capable of furnishing many facts which are of the greatest service in forming a diagnosis. The *form* of the lips is characteristic in different races; thus, the thick lips of the African negroes and the thin lips of most European races are well known. In conditions of general plethora the lips look swollen and big. A few cases have been recorded of great hypertrophy of the lips and neighboring parts, a notable example being given by Mr. Barnwell in the eighth volume of the "Clinical Society's Transactions."

The *color* of the lips is a matter of great importance. After great loss of blood the lips may appear of a waxy whiteness, and such an appearance should at once lead to questions likely to elucidate this point. A recent confinement attended by hemorrhage is the most common cause of this appearance in women. Anæmia and leucocythæmia, arising from no matter what cause, produce a pallor of the lips, and in investigating cases of anæmia, we invariably look to the mucus surface of these parts. It is right to remind you, however, that undoubted evidence of hydræmia may be present without any very obvious alterations of the tint of the lips.

The lips are often unduly red in cases of general plethora and in the early stages of many febrile conditions. A cyanotic tint of the lips may be due to extreme cold, to those malformations of the heart which gives rise to the condition known as cyanosis, and to mal-æration of the blood arising from no matter what cause, atmospheric, pulmonary, or cardiac. A patch of herbs on the lips (herpes labialis) is very commonly seen. It is a common accompaniment of an ordinary cold, and it is well to bear in mind that such an appearance may be indicative of more serious trouble, such as pneumonia. It is sufficiently often an accompaniment of pneumonia to make it incumbent upon us always to investigate this point when we are confronted with a patch of herpes on the lips.

In febrile conditions the lips get dry and cracked, and sordes accumulate upon them. Sordes are collections of dried mucous, evaporated saliva, and food particles which cannot be removed, owing to the general dryness of the mouth and the paucity of the salivary secretions. This condition of the lips is seen in the most extreme degree in the state known as the typhoid condition, in which also the lips are often brown or almost black.

Round the margins of the lips are occasionally seen cracks white lines, and little pits, the latter reminding one of the appearance known as the lineæ albicantes which occur on the abdomen after pregnancy. These appearances occurring on the lips are sufficient to raise a suspicion of congenital syphilis. The other indications of syphilis which we may find upon the lips are: 1. A true infecting sore or hard chancre, which is happily rare; and, 2 Mucous tubercles, which may be present in cases of congenital or acquired syphilis. These mucous tubercles have the same appearance when seen here as when seen seen elsewhere—flat, slightly elevated patches, with a dirty-whitish surface, surrounded by a congested areola. Epithelioma is among the more rare diseases of the lips, concerning which one one should be on one's guard.

The *movement* of the lips is a matter of great diagnostic importance. The muscular power of the lips may be impaired or abolished in several distinct conditions, such as hemiplegia, facial palsy, bulbur or labio-glosso-laryngeal paralysis, and general paralysis of the insane.

In hemiplegia the lip palsy is often slight, and in very slight cases which have partially recovered, a trifling drooping of the prolabium of the upper lip on one side, just sufficient to destroy the symmetry of the "Cupid's bow," is all that we can detect. The observation of this slight dooping and want of symmetry should always lead to an investigation into the history of the patient, and to questions likely to elucidate the question of hemiplegia. In marked cases of hemiplegia, and in cases of facial palsy from disease or injury to the trunk of the facial nerve, the paralysis of one-half of the lips is easily demonstrated, and on asking the patient to show the teeth it will be observed that the teeth are imperfectly exposed on the paralyzed side, and the angle of the mouth is drawn over to the sound side. Facial palsy may be double, and then this want of symmetry is not observed, but the face is expressionless, and the teeth and gums cannot be exposed.

In bulbar paralysis the condition is usually bilateral, and the patient is quite unable to move the lips. In the latter stages of this disease the lips waste, and the under lip droops so as to expose the gums and allow the saliva to run out of the mouth.

In general paralysis of the insane there is a paretic condition of the lips, and when they move they do so in a hesitating, jerky manner, which is very characteristic.

In alcoholism the movement of the lips is also often tremulous. In chorea the lips are liable to those uncertain, jerky movements which are so characteristic of this condition. In "muscular tie" one side of the mouth may be the seat of spasmodic movement. Lastly, in tetanus spinal meningitis there occurs that condition which is called the risus sardonicus, which is caused by a spasmodic retraction of the angles of the mouth.

Dribbling of saliva is a symptom which is due to many causes. It may be due to an excessive secretion of saliva, a condition seen in cases of mercurial poisoning and in some other states. It is present in cases where there is deficient movement of the lips and tongue, as in bulbar paralysis, or in cases where the movement of the tongue is rendered impossible or painful by the presence of sores and ulcers. In patients also with whom the act of swallowing is impaired or painful, as in cases of paralysis or stricture of the pharynx, or inflammation of the tonsils or throat, dribbling of the saliva is apt to occur. In children dribbling is a physiological condition, owing to a want of vigor and purpose in the movement of their lips and tongues, and in idiots this infantile condition would seem to be permanent. Old writers consider the dribbling of saliva to be characteristic of idiots and madmen.

An *inspection of the gums* occasionally affords important evidence of disease. Their *collor*, like the color of the lips, may be pale, or red, or livid, and is an indication of anæmie;or plethora, or those conditions mentioned in connection with the lips which give rise to a cyanotic tint. The gums are sometimes spongy and congested and liable to bleed at slight causes. This is often the case in depressed conditions of health, arising from whatever cause. It is present in a marked degree in persons who are under the influence of mercury, and to a less extent in those who are taking iodide of potassium. In leucocythæmia and in Hodgkin's diseases the gums are often swollen and pale, and occasionally they are stated to become gangrenous. In purpura, hemorrhage from the gums is a common occurrence. In scurvy the gums are very greatly and remarkably affected. They become sore and apt to bleed at the slightest touch, and get swollen, spongy, and livid. The lividity is stated to be most marked at the free edges. The swelling of the gums is so great as occasionally to obscure the teeth, and in extreme cases they protrude between the lips. They get livid and almost black, and undergo sloughing and ulceration, which causes the breath to be peculiarly offensive. The sloughing may leave the roots of the teeth exposed, and in such cases the teeth commonly fall out. Dr. Buzzard states that this condition of the gums is by no means invariably present in scurvy, and that all the other symptoms of the disease may be present in a marked degree while the gums are not noticeably affected. Indeed, the gums in scurvy may occasionally be paler than usual and contracted.

A blue line upon the gum may, in the vast majority of cases, be taken as certain evidence that the patient is suffering to a greater or less extent from lead-poisoning. This "blue line" is due to a deposit of lead sulphide in the tissues of the gums. Dr. Hilton Flagge has made sections of the margin of a gum affected with a lead line, and by the aid of the lower powers of the microscope was able to see that the discoloration was not uniform, but was distributed in the form of rounded loops. The pigmentation was seen to be due to minute granules, and these granules were situated sometimes in the interior of the smaller blood-vessels, and sometimes outside them in the tissue immediately adjacent. The deposit is in reality black, its blue appearance being due to the fact that it is seen through a thin translucent layer of gum. Care must be taken not to mistake the purple congested edge of the gum of persons who do not clean their teeth for the deep blue line which is caused by lead. The blue line is produced by the action of hydrogen sulphide upon the lead which is presumably circulating in the blood. The hydrogen sulphide is produced by the decomposition of food particles lodging between the teeth and adhering to the tartar. Persons who are careful to keep the teeth clean, and in whom no decomposition of the food particles takes place, may be suffering from lead-poisoning and yet have no lead-line upon the gums. The lead-line once formed, and being due to the deposit of an insoluble salt, may remain for months after the system has been freed from lead. Persons who have been exposed to the action of lead may exhibit no line upon the gums until after the administration of iodide of potassium. This is difficult of explanation, but the fact admits of little doubt. The blue or black discoloration caused by lead is not always limited to the margin of the gums, but may occasionally form black patches on the inside of the lips or cheeks.

Occasionally among the ill-fed and dirtily-kept children of the poor, and especially during the first dentition, the gums become swollen and the edges ulcerate, the ulcerated surface being covered with a dirty-gray secretion. This condition is known as gingivitis, accompanied by offensive breath and some increase in the flow of saliva.

The *teeth* often afford valuable evidence of constitutional conditions. Delayed dentition is apt to occur in children that are debilitated from any cause, but more particularly in the case in rickets. Finding the dentition delayed, we should always search for either evidence of rickets.

The milk teeth should begin to appear at the seventh month, and should all be "cut" by the end of the second year. The teeth appear in the following order—central incisors, lateral incisors, anterior molars, canines and posterior molars; and each of these five groups appears by the seventh, ninth, twelfth eighteenth and twenty-fourth month; the number of teeth which a child should have at the end of the months named being four, eight, twelve, sixteen, twenty. It may be some help to the memory to call attention to the fact that when a child is twelve months old there should be twelve teeth in the mouth. These numbers are liable to great deviation even in health. Some healthy children are precocious, while others are backward in the matter of dentition. The teeth may be wholly or in part deficient as the result of congenital defect. Caries or decay of the teeth is so common in this country that very few escape from it. It is more common in women than in men, and is predisposed to by pregnancy and by the scrofulous and tuberculous constitutions. It is said to be caused by the generation of acid from the fermentation of food particles lodged between the teeth. There is a condition known as "rocky" enamel, in which the enamel of the teeth is grooved and pitted and honeycombed. This condition is brought about by rickets, or by any depressing illness occuring during dentition. Occasionally the teeth get excessively worn, so that they appear truncated, and the dental arch presents the appearance of a flat level border, the exposed dentine presenting a yellowish appearance. This condition, of which a very good example was lately attending in my out-patient room, is rare, and is said to be predisposed to by syphilis, and to be favored by the use of gritty food. Mr. Jonathan Hutchinson has pointed out that a peculiar condition of the permanent teeth often exists in patients who are the subjects of inherited syphilis. The incisors and canine teeth are small, peg-like in shape, narrow at the free edge, and either excavated by a crescentic notch at the margin or marked by a crescentic groove. The conical condition is most marked, according to Salter, in the lower, and the crescentic notch is most conspicuous in the upper incisors. When the teeth are lost very early in life, inquiry should always be made as to whether the patient has taken much mercury, and if so, for what reason.

The *mucous membrane of the mouth* is sometimes swollen and red as part of a general catarrh. It may be swollen in consequence of gastric irritation brought about by errors in diet. In children who are ill fed, and especially during dentition, small, circular, painful ulcers called apthæ very frequently appear upon the gums and the internal surface of the cheeks. They are almost always an indication of gastric disturbance from injudicious feeding. When we get the mucous membrane of the mouth inflamed, and upon the inflamed surface a parasite funbus (the oidium albicans) growing, we have the well known disease called thrush. The mouth, tongue, and palate, and pharynx may be covered with white patches, and we may be in doubt whether these patches are due to curdled milk or diphtheria, but if a small quantity be placed under the microscope with a drop of caustic potash, the well known mycelium and spores of the oidium albicans are easily seen, and serve to clear up all doubts. Whether the fungus is the cause of the inflamed condition, or whether the inflamed patches form a fitting nidus for the growth of the fungus, is an open question. Thrush never occurs in well nursed children, and if a young child is fed upon gook milk and nothing else, thrush seldom appears. When, however, mothers give farinaceous matter to very young children, often combined with milk which is slightly sour, this sticky mixture adheres to the inside of the mouth, and if the mouth be not very carefully cleansed out after every meal, the decomposing food particles irritate the mouth, cause it to inflame, and form a soil upon which the oidium grows luxuriantly.

Thrush is liable to occur in adults towards the termination of chronic illnesses, when they are too weak to cleanse their mouths by vigorous movements of the tongue. I have seen patches of thrush also occurring in a patient the subject of labio-glosso-laryngeal paralysis, because the movements of the mouth were too feeble for the purpose of properly cleansing it. The lesson to be learnt from these facts is that in feeble persons the mouth needs to be artificially cleansed after feeding, by being sponged out with some antiseptic, such as a solution of borax, or, perhaps, there is nothing better than peppermint water, which to many persons is agreeable and refreshing. —*British Journal of Dental Science.*

ARTICLE VI.

A Case of Neuralgia of the First Branch of the Fifth Pair, of Six Years Duration, Cured by Duquesnel's Aconitia.

BY DR. M. LANDESBERG, OF PHILADELPHIA.

Mrs. B., thirty-five years old, had been suffering from trigeminal neuralgia for over six years previous to her coming under my treatment for progressive myopia. The first attack occurred in the summer of 1873, lasting for over sixteen weeks. From this time paroxysms were repeated with unabated violence, at intervals of two to four weeks, usually attacking one side of the face. In some instances the affection kept on for several days or even weeks. All the different kinds of remedies to which the patient recurred were of no avail. They did neither check the morbid process nor break the violence of the paroxysms.

Patient is of nervous temperament. Mental agitation was one of the most prominent causes of the paroxysms.

During my treating her for progressive myopia I had repeated occasion to observe, from the very beginning, the attacts of trigeminal neuralgia. The prodromal symptoms were slight photophobia and the appearance of a small ring of enlarged vessels around the cornea. Then ciliary neuralgia set in, bearing the features of genuine cyclitis. One spot of the upper ciliary region, outside from the superior muscle, became tender to such a degree that the slightest touch produced the most agonizing pain and intense symptoms of irritation. The latter rapidly increasing in the further course of the affection. The upper lid and its surrounding parts became enormously swollen and puffy, and intense chemosis of the conjunctiva of the eyeball developed. Pupil became extremely contracted, yielding but very slightly to atropia. The pain extended over the whole head. The œdematous parts were flushed, moist with perspiration, and showed increased temperature. In rare instances the lower lid and its surrounding parts also showed slight serious infiltration. Intraocular pressure and background of the eye remained normal. Vision was not impaired.

Induced by Dr. E. C. Seguin's paper on the treatment of trigeminal neuralgia, by Duquesnel's Aconitia, I tried this agent on my patient. The form for administering was as follows:—

℞.	Aconitiæ (Duquesnel's),	gr. ¼	
	Glycerinæ,	ʒj	
	Alcohol,	ʒj	
	Aq. menth. pip.,	℥ij.	M.

Sig.—One tablespoonful three times a day.

The therapeutical effect was striking. Perfect recovery was obtained after the patient had used two bottles of the prescription.

Eighteen months elapsed, during which period the patient enjoyed perfect health, when her right eye suffered injury by a blow, which caused intraocular morbid alterations. The exterior of the eye remained normal. On the third day after the occurrence the patient complained of tenderness of the eyeball. On examination, I found one spot of the upper ciliary region tender to the touch. I at first considered this tenderness as a consequence only of the lesion. On the succeeding days the pain became intense, photophobia and lachrymation set in, and slight serous infiltration of the conjunctiva of the eyeball developed. There was no doubt that I had to do here with a relapse of trigeminal neuralgia, provoked, likely, either by the blow itself, or by the mental agitation of the patient consequent upon it.

I recurred to aconitia, which checked the paroxysm in its very beginning.—*Med. and Surg. Reporter.*

EDITORIAL, ETC.

Pulp Capping, and the conservative treatment of this organ has perhaps more advocates to-day than ever, and fewer enthusiasts—that is, its desirability is more and more recognized, although its practicability is, except with a few, less confidently asserted. That many cases are successful few, save those who are utterly prejudiced will deny; that it is nearly uniformly successful few now claim. It is true it is well to try what can be done in many cases of exposure, but after all one comes to realize sadly that in cases not a few the safest method and that least liable to give trouble in the end is devitalization and removal.

To those who feel that they wish light on this subject, the method proposed and practiced by Prof. R. B. Winder, of the Baltimore College of Dental Surgery, seems reasonable, and Prof. W. claims is fairly successful. The ordinary steps being taken of careful removal of decay, perfect drying of cavity, etc., a small shred of very fine surgeon's sponge is saturated with liquor plumbi sub. acit., and placed over the point of exposure. Oxychloride of zinc is placed over this, *with no pain resulting*, due probably partly to the anodyne effects of the lead water and partly to the fact that the chloride of zinc is not diluted at the expense of the fluids of the pulp. The soothing and healing properties of the lead are well known, and the fluid is abstracted from the sponge very slowly. It is thought also that the sponge as it gives up its fluid contents retracts and gives slight room for the expansion of the tissues in case of inflammation. Prof. Winder claims that by this method his success is reasonably fair, and he hopes the suggestion may be useful to the profession.

H.

The Celluloid Infringement.—The Supreme Court of the United States has confirmed the decision of the Supreme Court of the District of Columbia, that the use of celluloid is not an infringement of the patent owned by the Goodyear Dental Vulcanite Company. This ends the struggle of the giant monopoly, which for years has sought to absorb everything in the reach of its money and its attorneys. The end of its exactions draws near, however, as the patent expires in May, 1881, when, unless they license dentists under the "Hæring" patent, as it is claimed they intend, the ubiquitous rubber agent will no longer visit the dental practitioners. Of all the men who have worked hard without pay to fight the claims of this company, none deserve more honorable mention than Dr. R. Finley Hunt, of Washington, D. C., who gave the subject many months of hard toil, both of brain and hand, and who worked up against the Rubber Company the most complete presentation of worthless patents and of casuistry and unfairness in dealing with a profession that has ever been recorded. Dr. Hunt deserves the thanks of all who are in any way concerned in seeing a monopoly broken, or an injustice continued in perpetration.

H.

The Fraudulent Diploma Man.—Dr. Buchanan, of Philadelphia, whose arrest has been published, was tried on a charge of conspiring to defraud, but was acquitted on the ground that the diplomas he sold were known to be worthless by those purchasing them. He was tried however on another indictment, and fined and imprisoned for a few months. The fraudulent diploma business will probably not be resumed by him, and it is to be hoped that it is effectually broken up.

H.

BIBLIOGRAPHICAL.

The American Agriculturist.—

This widely known and greatly appreciated publication, devoted to the farm, garden and household, completed its 39th volume with the December number; and its editors promise more than ever before, to travel through various parts of the whole country to study the wants and methods resulting from the local difference in soils, drops, climate, implements, customs, etc. Such energy and experience cannot fail to add greatly to the value of the volume of 1881, and render it even more useful and instructive than its predecessors. A German as well as an English edition is published under the charge of a skillful and successful cultivator and excellent writer. No other agricultural or horticultural publication can compete with the American Agriculturist in cheapness of price for the same amount of material, engraving, &c, and for the useful information its pages furnish. Its premium list contains 331 useful articles and hundreds of good books, the quality of every article being vouched for. Terms: $1.50 per annum, post free. Single number 15 cents. Publishers, Orange Judd & Co., 245 Broadway, New York.

The Scientific American.—

This useful and interesting publication will enter upon the 37th year of its existence in January, 1881. All classes of men seek its pages for information, suggestion, or entertainment, and having no rival, its editors and publishers are certainly striving to increase the usefulness of the paper to its readers and advertisers, as an examination of the volume just finished will clearly indicate. Every volume published has contained a large amount of original matter of special value to scientific and practical men, together with the best contributions to the practical literature of the sciences and industrial arts that the public journals afford. The *Scientific American* and Supplement are both valuable papers, the former at a subscription price of $3.20 per year, issued in weekly numbers; the latter also weekly at $5.00 per year, or the two published at $7.00 per year. Munn & Co., Editors and Proprietors, No. 37 Park Row, New York.

A Practical Treatise on Mechanical Dentistry.—By Joseph Richardson, D. D. S., M. D. Third Edition, revised and enlarged, with one hundred and eighty-five illustrations. Publishers: Lindsay and Blackiston, Philadelphia, 1881.

In the preparation of this new edition of a standard work, new and improved methods and appliances of recent introduction and important supplementary matter in connection with the older ones have received careful attention. Additional practical details relating to Continuous Gum Work are embodied in the new volume, also chapters relating to Celluloid and Gold Alloy Cast Base, after Reese's method. A distinct chapter has also been assigned to Porcelain Teeth in connection with Carved Block Work; also a separate chapter to the method of attaching teeth to a metalic plate base by means of celluloid or rubber. Considerable additions have also been made to the chapter on Pivoting Artificial Crowns, and other matter excluded which judgement and experience have proven to be impracticable, and useless, among the latter being the cast aluminum plate base, which the author regards as being practically useless.

The illustrations are finely executed and the style of the work is creditable to its well known publishers.

Atlas of Human Anatomy.—Published by A. E. Wilde & Co. 51 West Fifth St. Cincinnati, Ohio.

The parts 5 to 14 of this valuable publication are equal to the earlier ones for accuracy of detail and elegance of preparation. It is proposed to complete the work in forty-five parts, each to contain four large plates, mostly life-size. The text will be complete in ten parts of about forty pages, each at the price of fifty cents each part, and will be issued at intervals as the Atlas is published. Four parts of the Atlas will be issued every month, and it is expected that the whole work will be completed about January, 1881.

The Sanitarian.—

This monthly publication devoted to the preservation of the health, and mental and physical culture, contains information important and interesting to every class of society. Whatever thing, condition or circumstance in rapport with, or antagonistic to, the most perfect culture of mind and body is considered legitimate matter for discussion, &c., in *The Sanitarian*, and its mission is the protection of human life. Terms: $3.00 a year, single number 30 cents. Editor and Publisher: A. M. Bell, A. M., M. D. 8 Spruce St., New York.

MONTHLY SUMMARY.

Toxic Effects of Carbolic Acid.—The toxic effects of carbolic acid are attracting some attention at the present time. In a limited number of cases its contact with the skin in any form is poisonous, producing violent irritation. The probability is that these cases are to be set down as idiosyncrasies, which are liable to present themselves in individual cases here and there in regard to all remedial agents. There are persons whom opium will vomit, others whom it will purge, and everybody knows how many persons exhibit effects from it opposite to the rule. So it is with oil of turpentine, acetate of lead, etc. We have known numbers of individuals who dared not apply to the skin either of the two agents named, as they were certain to produce severe inflammation. Carbolic acid may be placed under the same head. Indeed there is scarcely an article in the materia medica in the use of which the practitioner does not occasionally meet with effects in direct opposition to the regular physiological action.—*Pacific Med. & Surg. Journal.*

Fatal Carelessness.—Eddie Hempbell, the son of Charles Hempbel, who resides at No. 6 Hawkins street, died from the effects of an illy extracted tooth as is stated by the attending physician. The facts of the case it seems are these: The little boy had been troubled with the tooth ache and his father took him to a German barber-dentist by the name of Gartman, corner of Franklin and Clinton streets. Gartman had extracted teeth for Mr. Hempbel previously and no trouble had ensued from the operation. After the tooth had been extracted the boy was taken home, but his face commenced swelling almost immediately. The next day Mr. Hempbel summoned Dr. Wilbur, who examined the boy and pronounced an abscess in formation and said that he would lance it the next day. Upon calling the day following the abscess had disappeared, evidently breaking, and the pus absorbed by the blood. The boy from this time began to get worse and Dr. Wilbur called in Dr. Koch for consultation. Their efforts proved of no avail and the boy died, nine days after being sick. The disease is specified among physicians as hospital fever, or a lighter stage of gangrene. The cause is attributed to the unclean condition of the instruments used by the dentist, it being very dangerous at this time of the year to use surgical instruments of any kind after an operation has been performed with them, unless they have been thoroughly cleansed and washed with carbolic acid. —*Sunday Morning Herald.*

Carbolic Acid Poisoning, according to the *London Medical Record*, may be under two different forms. (1.) Sudden and without apparent cause, the patient sinking under the dressing; five such cases, with one recovery are reported. (2.) Cases in which the septic symptoms are developed only slowly, and after some weeks perhaps. A sudden rise of temperature, it is thought, just after a Carbolic Acid dressing, should be viewed with suspicion. The obvious point remedy is to remove the dressing. Sodic Sulphates, as Glanhu's Salts, seem to form combinations with Carbolic Acid forming sulpho-carbolates, and so perhaps neutralize its effects in the system.

The Goodyear Patent.—The *Dental Jairus* states that the Goodyear Dental Vulcanite Co. have already made application for a re-issue of their patent, which expires by limitation in June, 1881. We think the *Dental Jairus* is mistaken. The only way in which the Goodyear Dental Vulcanite Co. can procure an extension of the Cummings patent is by special act of Congress, and we are assured that no such application has yet been presented to the Patent Committees of either the Senate or House of Representatives.—*Dental Advertiser.*

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ARTICLE I.

Proceedings of Maryland and District of Columbia Dental Association.—Annual Meeting.

WASHINGTON, OCTOBER 27, 1880.

The Association was called to order by the President, Dr. M. W. Foster, at 11 A. M., and was opened with prayer by the Rev. John Lanahan.

Dr. Donaldson, Chairman of the Executive Committee, stated that by an oversight no one had been appointed to deliver the welcoming address. He therefore, as chairman, extended to those from abroad a cordial welcome to the meeting and the city, and expressed the hope that this would be an interesting and useful meeting.

The President, Dr. Foster, then delivered the following address:

Gentlemen and Fellow Members of the Maryland and District of Columbia Dental Association:

In looking over the addresses of my predecessors I have found in them so much that is useful and instructive, I fain would in lieu of this address, present them to you again, if allowable, entire.

I shall quote from them, or other addresses, whenever I find the language more appropriate or the idea better conveyed than my own. We are again reassembled for the purpose of interchanging ideas; to brighten ourselves by attrition to new facts; to discuss and treat *new views* of old facts; to correct our past errors; to combat prejudice; to dessemminate useful knowledge and for social and friendly converse.

We have systematized our labors by the formation of the several sections, that it only remains for us to hear their reports and discussions on the same. It is therefore, my pleasant duty to call your attention to the necessity of a careful collection of statistics, for by these we stand or fall.

If our Association is to be a power in the land (as I hope and trust it may be) it must pay strict attention to details; must so watch its actions and be so jealous of its verdicts, as to elicit admiration and challenge criticism. To be able to accomplish this successfully we must throw proper safeguards around ourselves, and our membership, so we may say with the Apostle of the Gentiles "We are many, yet but one body. If one member suffers, all members suffer with it, or if one member be honored, all the members rejoice with it."

The great secret of success in life is sterling integrity; the great secret in all successful associations, is confidence: Can you have the one without the other? If then we expect the public, who is looking to us for correct information in our specialty, to believe in our edicts, we must first have confidence in ourselves; to attain this I would suggest to the committee in charge, a careful supervision of future membership, as one of the means, in my judgment, to place us in a proper position before the public.

Among the many advantages derived from the Association, is the opportunity furnished to the student to become better acquainted with the profession in all its different phases; it forms a guard of safety to the honest and competent practitioner, and a scourge to the charlatan; it will supply the public with the means of judging between scientific competence and ignorant practice; and thus save it from injury and imposition.

An Association to be in the best possible condition for progression, must be free, must throw to the winds all old fogy ideas, be ready and willing to receive new light, and yet strong enough to hold fast to all the best of past experience; or as Dr. Donaldson said in his address, "to be *properly careful* in taking hold of new modes of practice."

Without wishing to be personal, or too greatly credit this association with *all* the wisdom extant, I may safely say without fear of successful contradiction, that for its numbers, it is as Dr. Coy said, the "biggest kind of a little association;" and from the number of known level headed gentlemen present, one can feel assured that anything of merit will receive from it proper consideration and commendation, and any false theory will as emphatically receive its disapprobation and censure.

The many advantages this Association possesses over others, is due in a great measure to its local surroundings; having at all times easy access to the Smithsonian and other institutions of like character, and the co-operation of Army and Naval surgeons (who were furnished some three years since with carefully prepared circulars asking them to note the climatic and food effect on the teeth of the different nationalities where they might be stationed); these are advantages, I claim, not possessed by kindred associations, and, originating with this, is cause for a reasonable degree of pride and congratulation.

And in this connection, I would urge upon the sections the necessity of careful revision of their reports, so that nothing may go from here with the approval of the Association, that is not entirely reliable and authentic. For instance, when two practitioners of equal eminence in the profession make statements opposite in the extreme of the action of a remedy, or remedies; would it not be well to announce authoritatively through the section in charge, whether one remedy similarly applied can kill or cure at the same time?

There is one other important point which I think, clearly comes within the province of this Association, and I would ask the careful consideration of members to this subject. What influence does it exert on our institutions of learning? Have we not the right to a respectful hearing and consideration of any authoritative paper emanating from this or kindred Associations? If so, would it not be well and proper to have what might be termed a supervisory committee elected, whose duty it would be to suggest any needed reform for the future, or ask the correction of a present defect.

Associations are but foster mothers to Dental Colleges, from them they receive support through students of its members; is it not reasonable then, to assume that, Associations are in a better position to offer council to the Colleges than any other body?—not excepting the regents or trustees of said institutions. The Associations are as deeply interested in dental education, and not being connected with any institution are without the influence, however unconsciously it may be exerted, of the Faculties.

The American Dental Association through its Committee on Dental Education made the following report, August 5 th 1879. (1.) "That all dental schools shall demand some degree of proficiency in English education as preliminary to entering upon professional study. (2.) Not important to notice at this time. (3.) That this association claims the right to exercise a general supervision over the whole subject of dental education."

It is becoming each year more apparent and partially accepted by a number of the Colleges, that interested parties pecuniarily, are not the proper ones to grant diplomas. Dr. Elisha Towusend, in his address before the Pennsylvania Society of Dental Surgeons, said "Diplomas do not confer perfection; and sharp eyed quackery and earnest mediocrity, will occasionally teach the best how much they need to learn, as well as to show them how much they ought to teach."

The more intelligent and advanced men in our profession endorse the above and partial action of the Colleges as an advance in the right direction; the lesser number combat the action as harmful to the colleges at *present*, tacitly admitting it to be wise and proper legislation for the future.

Believing as I do that associations have the right to a proper supervision over the colleges of this country; I would suggest some action be taken by this meeting upon the subject, having perfect confidence that whatever action may be taken, would be just and result in mutual benefit.

I can more clearly present my views by quoting Dr. Hunt, who said, "I fully agree that there should be a single association in this country which should have the legitimate, conceded and delegated right to control colleges as to their general standing, and as to their standard of education."

Do colleges need this supervision, or is it presumption on the part of the Association to offer suggestions?

When one of our leading Universities in its annual circular makes the statement "a preliminary examination will be necessary commencing with the regular course October, 1st 1881," the closing lines are thus italicised; "*Students matriculating before the* 1*st of October will not be required to undergo the preliminary examination.*"

The question naturally arises: What constitutes the difference in a students attainments between the 30th of Sept., and the 1st of October. It is certainly confusing to "lookers on in Vienna."

The following couplet I think appropriate, and might go with the announcement:

"Mr. Orator Puff had two tones to his voice,
The one squealing thus, and the other down so;
In each sentence he uttered he gave you your choice,
For one half was B alt, and the other G low,
Oh! Oh! Orator Puff,
One voice for an orator is surely enough.

But he still talked away, spite of laughs and of frowns,
So distracted all ears, with his ups and his downs,
That a wag once, on hearing the orator say
"My voice is for war," cried which of them, pray?

It is my duty to call your attention to the failure of the bill "for the better protection of dentistry," presented to our last legislature; the failure of its passage was not due to any lack of interest or labor on the part of your committee, but from captious opposition outside; the bill could have been passed in an amended form, but the acceptance of this would have nullified its most important features; your committee thought best to withdraw it.

I now suggest that this meeting pass a resolution calling a mass meeting of all dentists in the State of Maryland to consider and present in force, a bill for the better protection of dentistry in our State. We surely cannot afford to be so far behind our sister States.

Gentlemen, for your kindness in honoring me with the position of your executive officer for the past year, receive my heartiest thanks. I now throw myself on your forbearance and ask your assistance in any imperfect ruling, trusting you will credit the error to the head and not the heart.

Dr. Hunt said it was usual to have a committee appointed to make a report upon the President's address, and moved that a committee of three be appointed for this purpose. The President appointed Drs. Hunt, Thompson and Coyle.

Dr. Donaldson moved that the reading of the proceedings be dispensed with. The motion was carried.

Dr. Winder made a verbal report in regard to the action taken by the Legislature of Maryland in regard to the Dental Law, stating that the bill had failed to pass.

Dr Noble moved the report be accepted and the committee be discharged. Carried.

Dr. Donaldson, chairman of the Executive Committee, reported the following hours for meeting, which report was accepted:

For the morning session from 11 until 1 o'clock; for the afternoon session, from 1½ until 4½ o'clock, and the evening session from 7 until adjournment.

He suggested that the evening meeting of Thursday be held at 8 o'clock on account of a meeting of the board of visitors of the Baltimore Dental College, which would take some of the members away. The President said it would be so ordered.

The committee also reported that there would be clinics Thursday morning at nine o'clock.

Dr. Hunt moved that the Executive Committee take into consideration and report upon a time for holding the annual meetings in the future that would not interfere to such an extent with the engagements of the members. The motion was carried.

Dr. Hunt, chairman of Scholarship Committee, reported the name of Benj. Flannigain, of Baltimore, for the scholarship in the Baltimore College of Dental Surgery. The report was adopted and Mr. Flannigain selected.

Reading of papers being in order, the first section was passed for the present on account of the absence of a paper. Dr. Hunt apologised for not having a paper on Metallurgy and Chemistry of Metals, saying he had been very busy and had not prepared one.

On motion of Dr. Waters the meeting adjourned until 1½ o'clock.

AFTERNOON SESSION.

There was no business transacted at the afternoon session on account of the absence of many members with important papers.

EVENING SESSION.

At the evening meeting Dr. M. H. Webb read the following paper:—

Restoration of Contour the only Way to Keep Permanently Separate the Margins of Enamel of the Proximate Surfaces of the Teeth, and Prevent Recurrence of Decay.

Restoration of the contour of a part or of parts of the crown of a tooth, signifies not only the building out and finishing of the gold to the line that defined the figure originally, but by it is meant the knuckling-ups of the tooth restored to the one adjoining in such a manner that the margins of enamel may be free from contact and that food cannot be forced between the teeth from the masticating surface.

For the restoration of contour, it is necessary to gain space to prepare the cavity, pack the gold, and finish the filling. This must be done either by wedging at the time of performing the operation or by previously pressing wood, linen, tape, or cotton between the teeth. After sufficient space has been made in this manner, white gutta-percha should be placed in the cavity and between the teeth, and remain a day or two or till the irritation incited by the wedging has passed away. Teeth ought not to be separated by rubber because of the irritation which it induces. It is often best to place a wedge of orange wood between the teeth, even after having pressed them apart, not only to gain more space than that had from previous wedging, but to stay the tendency to their approaching each other, and to steady the organs for the performance of the operation, particularly if the irritation from the slow wedging has not passed away so as to admit of the insertion of all or almost all, the gold by aid of the mallet. Space enough to insert and finish fillings, may be gained with less difficulty, by the rapid wedging of the incisor than of the bicuspid and molar teeth, especially when the cavity extends almost to the margin of cementum, or the teeth are firmly set in the alveolar process; however, in these and other cases, the gold should be built into and from the starting point, along the cervical wall and to the part where the convexity of the filling must be gradually increased, and when this much of the gold has been inserted by aid of the mallet and smoothly finished with fine separating or other files, a wedge of orange or other hard wood ought to be inserted between such gold and the tooth adjoining and sufficient space thus secured to enable the operator to so complete the operation that there shall be no space between the teeth, except at and near the necks. Unless separation by pressure is made in some such manner as indicated, gold cannot be so finshed as to have the teeth come closely together and prevent the wedging of food between them, except, perhaps, in the case of a young person when the space left from finishing the fillings with fine files and emery cloth or paper may again close. Pressure ought not to be too long continued or rudely made else circulation in the capillaries and protoplasmic bodies of the pericementum may be so interfered with as to prevent return to the normal condition of the parts after the wedge has been removed.

After sufficient space has been gained, the rubber dam should be applied to the two teeth separated by pressure and the tooth adjoining each that those pressed apart may not come together during the performance of the operation or insertion and finishing of the fillings, and that the organs may be the better operated upon. A cavity within the proximate wall of a bicuspid or molar tooth should be opened into from the masticating surface, excepting in rare cases, because even when but little tissue appears to be disintegrated, this surface would be almost reached upon the perfect removal of the decalcified tissue and the plate of enamel be liable to fracture if hard substances were to come in contact with it during mastication of food. It is far better to cut away the enamel between the cavity and masticating surface than to remove tissue from the entire proximate wall; besides, a clear view is thus had and the whole operation can be performed in a more satisfactory manner. The sulci and fissures are usually imperfect, and should be prepared and filled in connection with, and at the time of the performance of the operation within the proximate wall. That operations may be successful, each and every cavity must be so prepared that no disintegrated tissue remains, except a little discolored dentine just over the pulps, which should be left for its protection. The margins ought to be evenly and smoothly finished with fine, sharp burs files and emery-cloth, (the edges may be beveled in some cases but not rounded), and a groove should be cut in the dentine along each wall of the cavity. This groove should be about a sixty-fourth of an inch deep and must be made in the dentine just within and near the line of both the buccal and palatal or lingual portions of enamel and ought to extend from the masticating surface to the cervical wall, which should not be cut in that manner (excepting in some cavities in the incisor teeth,) because of there not being such a body of tissue at that part as to make it safe to remove any of it for the purpose named. In the preparation of a cavity in the proximate wall of the enamel of a bicuspid or molar tooth, enough of the tissue near both the buccal and palatal or lingual walls must be cut away, to so restore the contour of the parts and finish the fillings, as to keep the margin of enamel free from contact with the tooth adjoining. This is the only way to keep permanently separate the margins of enamel of the proximate surfaces of the teeth, and prevent recurrence of decay.

After the preparation of most cavities, particularly those that are deep, carbolic acid ought to be applied, to serve not only as a disinfectant, but to coagulate the protoplasm of the ends of the fibres in the dentinal canaliculi and partially obtund sensation. In those cases where thermal changes may produce more than the usual shock in healthy tissue after the gold has been inserted or the operation completed, oxy-chloride of zinc ought to be placed in the bottom of the cavity, as a non-conductor of the currents incited by heat and cold in the dentinal fibers.

When a cavity within the proximate wall of a bicuspid or molar tooth has been prepared as described, a starting-point should be made in some part of the cervical wall, and in that portion of the dentine which shall be the safest, along the boundary between it and the enamel or cementum. This point, in which to start the filling, should only be deep enough to retain the small pieces of gold first introduced, while other pieces are being built upon them and the filling carried along to the groove in each wall of the cavity. The gold ought to be built against every portion of the dentine, packed as nearly perfect as possible along the enamel and a little beyond its margins, and carried fully to the line that originally defined the contour of the part. To thus perform an operation it is necessary to build that part of the gold nearest the buccal and masticating surfaces, against the proximate surface of the adjoining tooth. By performing this operation with the electro-magnetic mallet, the passing of the packing instrument from off the edge against or over which the gold is being placed, may not only be avoided, but the surplus material can be so trimmed away during the performance of the operation, that comparatively little trimming is afterwards necessary.

Cohesive gold foil, No. 30 or 60 for large, or foil folded to No. 16 or 20 for small fillings, and not touched with the fingers, ought to be used in the performance of all operations, and should be made compact by the use of the electro-magnetic mallet, when it is carefully operated, especially in the cases just referred to, and those where frail edges of enamel are to be supported and protected. All gold should be cohesive, particularly where a mallet is used, so that each piece may remain just where it is placed, and also that the filling may always be one and inseparable. When foil has been so impacked that the substitute for lost tissue is complete, a fine saw or file should be used, to cut away the surplus material to the prepared edge of enamel against which the gold is placed, and to aid in shaping the filling like the original contour of the part; after which narrow strips (a line or an eighth of an inch wide) cut from fine emery-cloth or paper should be so manipulated as to properly finish the surface of the gold. When this has been done and the rubber dam removed, the finishing should be completed by the use of fine pumice and silex on linen tape. The gold at the masticating surface should be trimmed down with fine burs and made concave (or contour in such cases also); that is, finished down to represent the original figure or the outline of the part operated upon. The gold should be placed in the cavity as to be flush with the prepared margins of the enamel and made concave when such concavity is indicated. Fine burs should be used for the purpose of trimming and shaping such fillings, and also the palatal surface of the gold in the incisor and cuspid teeth, because the form of the remaining part or parts of the cusps, and prepared edges of enamel against which the gold is placed, may be changed or disfigured and the tooth be made less useful when corrundum cones are used. The polishing of the surface referred to may be done with pumice and silex mounted upon suitably shaped points of wood, leather or rubber. In each and every case the gold ought to be built out to the original contour of the part and a little beyond the margin, then finished down to the surface of the enamel so that the outline of the whole filling shall be the same as the line that bound, defined or terminated the lost tissue. This line ought to be fully restored, particularly the proximate surfaces of the bicuspids and molars, and the gold should be carefully trimmed down to, and finely finished with, the margin of enamel, which margin, in these cases more particularly than in others, must be free to prevent recurrence of decay. If gold be not placed compactly against, and be not flush with the edges of enamel, the operation is not such as is demanded for the preservation of the remaining tissue. A plane surface of gold should not be made, because the tooth thus operated upon and the one adjoining may move closely together, and disintegration of enamel then take place near the part in contact.

Case after case could be cited where disintegration has taken place near the buccal or palatal wall of the enamel, that came in contact along the proximate surface against which gold (and other material as well) had been placed, while other parts around the same filling remained free from decay. Recurrence of decay did not take place in the same mouth where there was such full restoration of the contour of missing tissue and close knuckleing-up of the teeth as to leave the margins of enamel free from contact and prevent the wedging of food between the proximate surfaces thus restored.* Restoration of contour prevents contact of the margins of enamel, and this prevention is necessary, especially when the tissues of the organ operated upon, are not fully calcified. The contour of missing tissue ought always to be restored with gold, that the enamel of one organ may be free from contact with that of the next in the arch, and also that a part of the gold in one, may be in close contact with the normal tissue of, or a filling (if one has been inserted) in the adjoining tooth, when disintegration is likely to take place, because of the freedom from proximity and the cleansing (by the saliva or fluids taken into the mouth if by nothing else) of the margins of enamel against which the gold has been placed.

All operations ought to be performed as artistically and made as nearly perfect as possible, so that if gold is exposed to view, its appearance shall be beautiful and rather pleasing than otherwise. When operations have been so performed as to entirely prevent fluids or semi-solids from entering between gold and the tissue against which it is placed, and all discoloration has been removed from the surface of remaining tissue, the gold-tint may be seen through the light walls or edges of translucent enamel soon after the removal of the rubber dam and completion of the operation. If an opaque or dark line or spot be visible at or near the parts where gold ought to be in contact with the dentine or enamel, the operation has been imperfectly performed, and if not re-performed, as it ought to be, chemical action may soon follow and the entire filling prove a failure. If operators were always very thorough in their work, there would be no occasion to refer the cause of a failure in dental operations to chemical action, or to the incompatibility of filling material with dentine.

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* For the instruction to restore so fully as I now do the contour of the teeth, and "knuckle" them up closely to each other (as well as for instructions in other directions,) I am indebted to Dr. W. H. Atkinson.

Disintegration commences just above or near the part of enamel in contact in the upper, and just below it in the lower, and soon takes place along the entire proximate surface, and extends to the dentine in which tissue decay makes rapid progress, but in those cases where the system is in good condition, and the tissues are first-class, disintegration takes place slowly and is not so extensive, so that where decalcification of enamel is only superficial it can be removed, and, after a finely finished surface is made, decay will not be likely to recur. In no case should a permanent space be made or left between the teeth, for even in such cases as those just mentioned food may so wedge against the gum as to bring about recession of this tissue and exposure of the necks of the teeth, and finally lead to the formation of a cavity of decay at the part referred to. Permanent separations ought not to be made for the reasons that they interfere with mastication, annoy the patient, and, with few exceptions, do not prevent disintegration upon or about the surfaces that have been cut. The teeth again come in contact almost invariably, excepting where antagonists prevent them; food wedging between them undergoes fermentation and disintegration takes place, and that too, in a part of the tooth where it is difficult to perform a first-class operation. This may not take place, however, till long continued pressure of food paralyzes the nerves in the papillæ throughout the gum-tissue pressed upon, and breaks the circuit or obstructs the movement of the molecules of living matter through that fine, reticulated line between the gum (and all other tissue) and the brain, and the patient is therefore not notified of the presence of such obstruction to the neural and vascular circulation. This condition of the tissue as inevitably leads to its return to the embryonal state as does interference with the nutrition of any other part of the system.

In those cases where tonicity is at normal standard the gum is so close to the necks of the teeth as to prevent the lodgment of foreign matter beneath the margins; not only this but the tissue fills the space between the teeth almost entirely and protects the parts it covers. The gum should therefore be protected by full restoration of the contour of the enamel that is missing, and the gold ought to be finely finished at all points, that there may be no obstruction to the tissue again closing around the neck of the tooth operated upon. In this manner the margins of enamel at or near the neck of the tooth against which the gold is placed and smoothly finished, is protected by the gum, and, if the whole operation has been properly performed, recurrence of decay at that part is prevented. If disintegration does not extend to, or beneath the margin of the gum, both the enamel and dentine of the proximate, as well as buccal surfaces of the teeth, (especially those in which calcification of enamel is imperfect) ought to be cut away with fine burs, to about the sixteenth of an inch above the part where the gum closes around the tooth, so that when the operation is completed this part may be protected from foreign matter. When the necks of the teeth are kept separate as in nature, and the gum is in normal condition, it protects the portion of enamel, and well inserted and finely finished gold which may be beneath its margins so perfectly that disintegration, and even discoloration, is prevented. In after years there may be lack of nutrition to the gum, or the circulation may not be full or free in the capillaries of the part, and the tissue may not close around the necks of the teeth so tightly, but become less firm in texture or commence to return to its embryonal condition. If there be such an acid condition as to disintegrate the enamel, decay may then take place above or about the cervical margin of the filling, but if this be not the case and the saliva be alkaline, deposit of calcareous matter may take place beneath the margin of the gum, and, though there be no recurrence of decay, pericementitis may follow and deposition of such matter prevent the rebuilding of the tissue or keep irritated, or finally break the fine line of living matter in net-like arrangement between the epithelial and other bodies of the part.

When operations have peen performed in the manner described, and the fillings are as finely finished as suggested, they are the best for the preservation of remaining tissue protection of enamel over which the gold is placed, and for the prevention of the wedging of food against and the consequent recession of the gum; they subserve well the purpose of mastication, and present a beautiful appearance; in a word, the only way to keep permanently separate the margins of enamel of the proximate surfaces of the teeth and prevent recurrence of decay, is by full restoration of the contour of the tissue that is lost.

[TO BE CONTINUED.]

ARTICLE II.

Correspondence between Dr. T. B. Gunning and the Census Bureau.

The following correspondence will show to what degree the dental profession is indebted to Dr. Thos. B. Gunning, of New York City, for relief from an unwarranted demand for statistics, on the ground that dental offices are "establishments of productive industry," and dental practitioners required to furnish statistics of manufactures to the Census Bureau. Dr. Gunning's clear and able letter convinced the Superintendent of the Census Bureau that such a demand was made through pure ignorance of what dentistry is, and the result is that the profession generally has been saved from a great annoyance and trouble, by the Superintendent of the Census, on account of the information furnished by Dr. Gunning, having determined to omit from the tabulations of his office dentistry in any of its branches.

DEPARTMENT OF THE INTERIOR.—CENSUS OFFICE.
Office of Chief Special Agent,
21 Courtland Street,
New York, Dec. 14th, 1880.

Dr. Thos. B. Gunning,
Dentist,
34 East 21st, St., City.

Sir.—You are reported as declining to give the information necessary to fill the blank handed you by my assistant, the form not being as you deem the best. I have to say that this form has been prepared by the Census Department, and we are required to obtain the information necessary to fill it from you, which the law compels you to give.

I trust therefore you will give us no further trouble in the matter, but fill the enclosed blank and resturn it to this office.

I am, yours respectfully, &c.,
Charles E. Hill,
Chief Special Agent for the City of New York.

New York, Dec. 15th, 1880.

Charles E. Hill, Esq.,
Chief Special Agent for City of New York.

Sir.—Your letter to me of the 14th tells that your assistant handed me a blank of which the form has been prepared by the Census Department. I am thus corrected in my mistake, into which I was led by the peculiarity of the blank above mentioned and by the subsequent conduct of your assistant, in supposing that he was an agent of a company claiming some patent.

When he first called I thought that he was from the Census Office, and I acceded to his request to look into the blank. Finding nothing in the paper as printed which referred to my profession—Dental Surgery, I studied the penned interlineations in red ink. My conclusions were that properly I could not say anything, and I waited for his return. When he came I suggested that perhaps I could make a statement on a schedule such as is left with surgeons and physicians; he replied, in substance, that they did not have to make any return; that there was no other schedule, and he gave me to understand that surgical operations, etc., as I might except.

After further remarks and some apparent annoyance at my endeavors to gain moreinformation, he suddenly left.

This in consideration of the fact that I had reported to the Census Agent some months before, and that although over forty years in practice, I had never heard of any special return being asked for from Dentists—led me to conclude that the blank schedule was presented to me for an illegal purpose.

In answer to the remainder of your letter I would say first, that I am very desirous to comply with every legal demand, and also save you and all connected with the Census Office from trouble so far as I know how. In your letter you say that you are required to get from me the information necessary to fill up the blank; while you also trust that I will fill it up. But you do not tell me what information you require; and in my judgment I have nothing to report upon the schedule which you have mailed to me, and I am willing to endorse] this statement upon it, if you think it will facilitate matters. Awaiting your instructions, I am, sir, your obt. servt.

T. B. GUNNING.

DEPARTMENT OF THE INTERIOR.—CENSUS OFFICE.

Office of Chief Special Agent,
21 Courtland Street,
NEW YORK, DEC. 17th 1880.

My Dear Sir.—I have great pleasure in owning receipt of your very full and courteous reply to my letter of the 14th. inst.

The object of the inquiries submitted to you is to ascertain the amount of industry expended upon the "mechanical" branch of Dentistry—and the form of schedule has been approved by the Census Office.

To these inquiries, a statement of the fact that one performs *no* mechanical but only surgical dentistry is, it appears to me, a sufficient answer, but you will appreciate the inability of this office, correctly to determine such a question except by actual inquiry—and even then not without some embarrassment, from the difficulty of making the matter clear to all minds. I should esteem it a favor if you would drop in here (Room 57) and grant me a personal interview, if you should be in the vicinity at any time soon, in order that my official intercourse with the members of your profession, may be in strict conformity with such suggestions as the more prominent and intelligent may offer, towards the accomplishment of the end sought.

I am, sir
Very Truly Yours,
CHARLES E. HILL,
Chief Special Agent.

THOS. B. GUNNING, M. D.
34 East 21st. St.,
NEW YORK CITY.

NEW YORK, DEC. 24TH. 1880.

CHARLES E. HILL, ESQ.,
Chief Special Agent, Census Office.

Sir.—I have the pleasure to acknowledge the receipt of your answer to my letter of the 16th inst.

I am unable to call at your office in time to make the suggestions available which you have so politely invited me to offer, and especially as they refer to the interests o convenience of other practitioners of Dental Surgery, place my views on paper. This seems advisable also, a my opinions are radically opposed to what appears to b the settled purpose of the Census office. For the courtes of your communication does not make it suggest any chang of purpose since you first wrote to me, but rather a wis to learn the best means to accomplish it.

In regard to what is now called for in the schedule lef with dentists, it is both improper to ask and impracticabl to answer; and if the results obtained are embodied in th Census Report, it will excite ridicule and indignation whereas by giving this up the Census officers will be pu to less trouble, much money be saved to the country an the census report be more legitimate. This schedule an your letters to me demonstrate to my mind that the difficulty in the way of the Census officers is that they do no comprehend the specialty of Dental Surgery. When it nature is shown to them, they will, I think, see that it i unwise and also illegal to demand statements from denta practitioners, in respect to their professional doings.

You say to me: "The object of the inquiries submitte to you is to ascertain the amount of industry expended o the "mechanical" branch of Dentistry, and the form o schedule has been approved by the Census office." Yo then intimate that surgical operations may be excepted.

The word Surgery derived from Chirurgery denote handwork in connection with the art of healing, and thi whether manual or instrumental, or both conjointly.

Orthopedy (*Medical*) is the art of curing or remedyin deformities in the human body.

Prothesis (*Surgical*) signifies the addition of some artif cial part to the human body.

Marked examples in both of these classes are shown i the Report, edited by Professor Francis A. Walker, whe Chief of the Bureau of Awards of the International Exh bition, 1876, and now Chief of the Census Office, Depar ment of the Interior, Washington, D. C.

1st. A long description of the exhibits in the Dental Museum of the Noel Winderling Bros. of Milan, Italy; and on page 24 as now shown: "Then followed twenty-two specimens of *prothesis* and *orthopedy*, embracing pivot-teeth, dentures, complete and incomplete, with and without spiral springs, the various methods of retention by atmospheric pressure and by clasps, and a series of orthopedic apparatus for the correction of congenital malformations of the palate, and loss by scrofulous and syphilitic necrosis."

2nd. The report on "Hard rubber appliances for fractured jaws," opens as follows: "Mr. Thomas B. Gunning, of New York, exhibited a series of splints and appliances for the treatment of simple and compound fractures of the jaw."

Nearly four pages are given to their explanation, which closes thus:

"In connection with the splints, was a series of casts illustrating the double compound fracture of the jaw of the late Hon. William H. Seward, showing the jaw broken on both sides between the bicuspid teeth. Also a double cast of the upper and lower jaws as held by the splint for 68 days.

As no teeth were left in the upper jaw, the wings and cap were used as shown in Fig. 3.

The result was thoroughly satisfactory."

3rd. On page 28 "Hard rubber appliance for Congenital Cleft palate," the opening says: "This contrivance is a very marked improvement over all previous appliances for rectification of this distressing malformation." It was first applied by Dr. Gunning in 1864."

"These plates avoid the objectionable featuress of earlier appliances and to some extent enable the wearer to utilize the action of the muscles of the cleft velum."

These extracts are from the "General Report," certified as follows:

"INTERNATIONAL EXHIBITION,"
PHILADELPHIA, 1876.

PROF. FRANCIS A. WALKER,
Chief of Bureau of Awards.

Sir.—I have the honor herewith to transmit the report of the Judges of Group XXIV, on Medicine, Surgery and Prothesis.

Respectfully Yours,
J. H. THOMPSON,
Secretary Group XXIV.

Of these Judges, one was Surgeon General, German Army, one from Austria, one from New Orleans, and the Secretary lived in Washington, D. C. No one of them was a dentist; they were all in Medicine and Surgery, and their testimony shows that these exhibits were surgical.

These appliances embrace or represent in principle all which dentists make or use in practice.

In support of my right and ability to state this, I submit that in 1866 I was appointed to decide upon the instruments and appliances for which space was asked in the Paris Universal Exhibition of 1867, as shown by the following extract from the Official Circular of the Department of State, Washington D. C.

"CLASS II. MEDICAL INSTRUMENTS.

Dr. J. K. Barnes, Surgeon General of the United States; Dr. Frank H. Hamilton, Professor of Surgery, Dr. Wm. H. Van Buren, Professor of Surgery; Dr. Ernest Krakowizer, Professor of Surgery; Dr. John M. Carnochan, Professor of Surgery; Dr. Thomas B. Gunning, Surgeon."

I have also been a practitioner of dental surgery in all its branches for over forty years; as shown in the Contemporary Biography of New York.

The agent of the Census Office, who called upon me, when saying I might except surgical operations, mentioned the extraction of teeth. Now as the extraction of teeth is surgical: inserting artificial ones to be used by the patient is not only more useful, but also surgical, according to the import of the surgical terms, hereinbefore presented.

Prothesis includes all forms of artificial teeth, with or without plates, and in every method of insertion, together with all constructions worn within the mouth, or any artificial addition to the human body.

Orthopedy includes appliances for congenital and acquired cleft palate, and for all malformations of the parts within and around the mouth, and for irregularity in the teeth &c.

To apply splints within the mouth in fracture or resections of the jaws, or for any other purpose, with or without external appliances, or these latter also, is surgery.

The appliances made in the operating rooms and laboratories of dentists which the Census Officers class as mechanical are made only after examination of the patient, or of the mouth, or parts for which the appliance is needed. In some cases teeth or other parts require removal or some additions; such as fillings, alterations in form, extraction, the removal of diseased bone, &c., and the healing of the parts.

In most cases the appliance cannot be made except by the aid of casts or impressions; these are taken off, or from each *particular patient or person*, for whom the appliance is necessary, and without whose co-operation the work cannot begin, and when the appliance is finished it is useless and of no value; except to or for that *particular patient.* These appliances are thus surgical; they are the results of diagnosis, prognosis and handwork combined to produce a useful result in, or appliance to, or for the human frame; this even when no medicine is given or prescribed, is surgery.

In filling teeth the result of the dentist's labor, is the addition of artificial parts to defective organs of the human body; this addition to each tooth of a patient being when completed virtually a part of that *particular person.* Filling teeth is therefore a surgical operation.

I have submitted only those exhibits, entered by dentists, which were remarked upon at length in the Official Report of the International Exhibition of 1876, edited by Professor Francis A. Walker, who is now Chief of the Census Office. One of these three exhibits was from Italy, two, my own, from New York. These exhibits as before stated included all the principles involved in the appliances used, and in those made by dentists for their patients, each appliance being made for and used only by the person for whom it is constructed.

The Report also remarked upon exhibits of a different class, viz.; of large and varied assortments of artificial teeth and of those which included all the materials and the manufactured articles made for and supplied to dental practitioners, who select what ever they require to be used in the different operations of their specialty.

These two distinctly different classes of exhibits, illustrate precisely the point at which the Census Office should stop in its demand for reports.

Those who make or sell whatever is, or may be, required by, and be useful for *many different persons* whether dentists or not; may perhaps be called upon to report.

Dentists and other specialists of Medical and Surgical art, who stand in delicate and confidential relations to their patients, and do for each one that which the case requires, should not be asked to report in respect to their professional doings; otherwise dental practitioners might be called upon to give information in regard to their personal treatment of any one of their patients

I have presented enough to show that the Dental Surgeon cannot properly be subjected to investigation and annoyance in respect to his professional work any more than the surgeon in other specialties of medical art: and the agent from the Census Office said that no schedule was left with physicians and surgeons; that they, lawyers and professional men were not asked to report; and your letter intimates that for surgical dentistry no statement is required.

I therefore protest against the novel and unjustifiable demand now made, for reports from Dental Practitioners.

I remain Sir, Your obedient servant,
THOMAS BRIAN GUNNING, D. D. S.

DEPARTMENT OF THE INTERIOR—CENSUS OFFICE.

Office of Chief Special Agent,
21 Courtland Street.
NEW YORK, DEC. 28th, 1880.

DR. T. B. GUNNING,
34 East 21st Street,
CITY.

My Dear Sir.—I have to thank you for your very courteous and interesting communication under date of the 24th., this morning at hand.

Its reception was most opportune, inasmuch as I was at the moment, closing an official letter to the Superintendent of the Census. discussing the same subject to which your letter relates, and which it so ably treats.

I have therefore transmitted it to him with my own, and await his definite reply, when I trust any difference of views which may exist between any of the members of your profession and the Census Office, will vanish.

Very Truly Yours. &c.,
CHARLES E. HILL,
Chief Special Agent.

DEPARTMENT OF THE INTERIOR—CENSUS OFFICE.

Office of Chief Special Agent.
21 Courtland Street,
NEW YORK, JAN. 4TH, 1881.

DR. T. B. GUNNING, D. D. S.
34 East 21st. Street,
NEW YORK.

Dear Sir.—Referring to my letter of the 28th. ultimo, I have now to say that the superintendent of the Census, upon the representation made to him by this office of the general reluctance of the Profession to give the information contemplated by the schedule, and upon consideration of the paper by yourself submitted to him, advises me (under date of yesterday,) that he has determined to omit from the tabulations of this office "Dentistry in all its branches."

All the schedules now in this office will be endorsed to this effect, and respectfully returned to their respective makers.

I am sir, Very Truly Yours,
CHARLES E. HILL,
Chief Special Agent.

ARTICLE III.

The Vulcanite Company vs. the Celluloid Company.

SUPREME COURT OF THE UNITED STATES.
No. 67—OCTOBER TERM, 1880.

The Goodyear Dental Vulcanite Company,
Appellant,
vs.
Charles G. Davis.

Appeal from the Circuit Court of the United States for the District of Massachusetts.

Mr. Justice Strong delivered the opinion of the Court.

The invention described in the Cummings re-issue patent is claimed in the words following: "The plate of hard rubber or vulcanite, or its equivalent for holding artificial teeth, or teeth and gums, substantially as described." The claim cannot be understood without reference to the details given in the specification. In that it is said to consist "in forming the plate to which the teeth, or teeth and gums, are attached, of hard rubber, or 'vulcanite,' so called—an elastic material possessing and retaining in its use sufficient rigidity for the purpose of mastication, and at the same time, being pliable enough to yield a little to the motions of the mouth." The mode of "forming" the plate is then minutely described. The earlier steps of the process need not be particularly noticed. They relate to the formation of a plaster mould, fitted to the corresponding part of the mouth, with the artificial teeth adhering in the mould in exactly the relative position they are to occupy in the hard-rubber plate. The specification then proceeds as follows: "The teeth are provided with pins projecting therefrom in such a manner that the rubber which is to constitute the plate will close around them, and by means of them, hold or secure the teeth permanently in position. The plaster mould, with the teeth adhering therein, as just described, is now filled with soft rubber, a little at a time, pressed in with the finger, or in any other convenient way; and care is to be taken that the rubber is made to completely fit into the cavities and around the protuberances, including the pins, and is filled in to the thickness or depth desired to form the plate." "I then," says the patentee, "lock the rubber plate in position by shutting the other half of the plaster mould over it, to insure its retaining its exact form while warming, and then heat or bake it in an oven, or in any other suitable way. The soft rubber or gum so inserted into the mould, is to be compounded with sulphur, rubber, &c., in the manner prescribed in the patent of Nelson Goodyear, dated May 6, A. D. 1851, for making hard rubber, and is to be subjected to sufficient heat to vulcanize or harden it, substantially as directed in that patent. It is also to be colored in imitation of natural gums, by mixing it with vermilion, or other suitable coloring matter, while in the soft state. After the plate has been heated sufficiently to harden it, or convert it into hard rubber or vulcanite, so called, the mould is removed, and the plate is polished ready for use."

Such is the description both of the material of which the plate is formed, and of the method or process by which it is made.

We made occasion, in Smith *vs* Goodyear Dental Vulcanite Company *et al.*, 93 U. S. Rep., 486, to construe this patent, and determine what the invention claimed and patented really was. We held it to be "a set of artificial teeth, as a new article of manufacture, consisting of a plate of hard rubber with teeth, and gums secured thereto in the manner described in the specification, by imbedding the teeth and pins in a vulcanized compound, so that it shall surround them while it is in a soft state, before it is vulcanized, and so that when it has been vulcanized, the teeth are firmly and inseparably secured in the vulcanite, and a tight joint is effected between them, the whole constituting but one piece." We said "the invention is a product or manufacture made in a defined manner. It is not a product alone, separated from the process by which it is created." The process detailed in the description antecedent to the claim, and referred to thereby, is as much a part of the invention as are the materials of which the plate or product is composed. Both are necessary elements of it. Hence, to constitute an infringement of the patent, both the material of which the dental plate is made, or its equivalent, and the process of constructing the plate or a process equivalent thereto, must be employed. It is, therefore, essential to a correct determination of this case, to consider what was the material made by the patentee an element of his invention, and what can be considered an equivalent therefor.

It is impossible to read the specification of the original patent, or that of the re-issue, upon which the suit is founded, without the conviction that the patentee had in mind, primarily, a single substance for his material, and that one of a peculiar character, itself a compound, discovered and patented not long before; thus in the original, which was loosely drawn, the invention was said to consist "in forming the plate and gums, to which the teeth are attached, of rubber, or some other elastic material, so indurated as to be rigid enough for the purpose of mastication, and pliable enough to yield a little to the motions of the mouth, and in one piece, the teeth being imbedded in the elastic material while the said material is in a soft condition, and then baked, with the gums and plate, so that the teeth, gums and plate will all be connected, forming, as it were, one piece." And again "the plate and gums are formed of one piece, and of rubber, and the compounds commonly employed therein, or of gutta-percha, or in fact, of any elastic substance which can be reduced to a soft condition, *and then vulcanized*, or hardened sufficiently to answer the purpose. The rubber or other material used is first moulded to fit the shape of the mouth, and the gums formed, and while soft and pliable the teeth are embedded in the gums. * * * The teeth, gums and plate being thus connected, are then baked until the elastic material becomes sufficiently vulcanized, when the process is completed." The claim also expressed the same thought. It was "forming the plate and gums in which the teeth are inserted,in one piece of hard rubber or vulcanite, *i. e.*, an elastic material which can be hardened sufficiently for mastication, and retain a portion of its elasticity, so as to yield a little to the motion of the mouth, as herein set forth, and for the purposes specified." Though the specification spoke of rubber, or rubber and its compounds commonly employed therewith, or of gutta-percha, or of any elastic substance that can be reduced to a soft condition and then vulcanized, or hardened sufficiently to answer the purpose, it is evident only such substances were intended, as are either soft in their natural condition and capable of vulcanization, or, if hard naturally and reduced to a soft state, were then capable of being vulcanized or hardened by baking. The description implies an exclusion of all substances which have not such capabilities. If not, then gold plates would have been within the patient, if the material only be considered, for gold is elastic, when in thin plates. It is capable of being reduced to a soft condition, and it hardens by cooling, but it does not harden by heat or baking, nor is it capable of vulcanization.

If, now, we turn to the specification and claim of the re-issued patent, (which of course, cannot be more comprehensive than the original,) it will be found that the material is still more distinctly and exclusively pointed out. The material is, so far as possible, restricted to a substance either vulcanized or capable of vulcanization. There the invention is said to consist "in forming the plate to which the teeth, or teeth and gums, are attached, of hard rubber or vulcanite, so called, an elastic material," of certain capabilities mentioned. Not an intimation is given that any other substance than hard rubber, or its synonym vulcanite, would meet the requirements of the invention. Throughout the specification the patentee speaks again and again of his invention as a hard-rubber plate, and he describes minutely the process or mode of making it. After having mentioned the arrangement of the teeth in a mould, he says: "The plaster mould, with the teeth adhering therein, is now filled with soft rubber, a little at a time, pressed in with the finger, or in any other convenient way," &c., &c., &c. "I then lock the rubber plate in position by shutting the other half of the plaster mould over it, to insure its retaining its exact form while warming and then heat or bake it in an oven, or in any other suitable way. The soft rubber, or gum, so inserted in the mould, is to be compounded with sulphur, rubber, &c., in the manner prescribed in the patent of Nelson Goodyear, dated May 6, A. D. 1851, for making hard rubber, and is to be subjected to sufficient heat to vulcanize or harden it, substantially as directed in that patent. Thus it appears that, whatever the material used in the construction, a dental plate, according to the patent, was required to undergo a process of vulcanization in the manufacture, and to be made what it is, whether denominated rubber, hard rubber, vulcanite or other elastic material, by that process. Every substance, not capable of vulcanization by that process was, therefore, necessarily excluded from the reach of the patentee's invention. Nothing could more plainly show that a dental plate made of any other material than a compound, vulcanized according to Nelson Goodyear's process, was not intended by the patentee and by the Patent Office to be covered by the patent. By Goodyear's patent, caoutchouc or soft rubber is converted into hard rubber; that is, vulcanized, by mixing sulphur with it in about the proportions of from four ounces to a half pound of the former to a pound of the rubber, and then heating the compound during a period of from three to six hours, to a temperature of from two hundred and sixty to two hundred and seventy-five degrees of Fahrenheit. The use of that process was made indispensable to the invention, and it was the product of that which was the material of which the patented plate is constructed. If, when the patent was granted, there were known substances, other than rubber or caoutchouc, gutta-percha, or gums, that could be vulcanized by the Goodyear process, and converted from a soft, into a hard, elastic material, any use of that material for a dental plate, might have been an equivalent for the Cummings material and an infringement of his patent.

This construction of the patent is confirmed by the avowed understanding of the patentee, expressed by him, or on his behalf, when his application for the original patent was pending. We do not mean to be understood as asserting that any correspondence between the applicant for a patent and the Commissioner of Patents can be allowed to enlarge, diminish, or vary the language of a patent afterwards issued. Undoubtedly a patent, like any other written instrument is to be interpreted by its own terms. But when a patent bears on its face a particular construction, inasmuch as the specification and claim are in the words of the patentee, it is reasonable to hold that such a construction may be confirmed by what the patentee said when he was making his application. The understanding of a party to a contract has always been regarded as of some importance in its interpretation.

In his letter to the commissioner, under date of July 30, 1855, written by his attorney, after striking out all reference to gutta-percha, he said: "I beg the office not to consider that because gutta percha has been used heretofore with artficial teeth. Mr. Cummings' invention is, therefore, the mere substitution of one substance for another and a similar one." The vulcanizing process makes all the difference, and changes the article of manufacture entirely. So in his letter of the same date he amended his specification so as to make it read: "I do not claim the use of gutta-percha, or of any material which is merely rendered plastic by heat and hardened by cooling, in the manufacture of sets of artificial teeth; but what I do claim as my invention, and desire to have secured to me by letters patent, is the improvement in the manufacture of sets of mineral or other artificial teeth, which consists in combining them with a rubber plate and gums, which (after the insertion of the teeth) are vulcanized by Goodyear's process or any other process." . . .

On a renewed application Dr. Cummings was informed that the office would not object to the admission of a claim limited to the use of vulcanite or hard rubber. In response to this he amended his claim by inserting the word "hard" before "rubber," and also by striking out the word "other" before the words "elastic material," in the claim as previously made, and substituting therefor the words "vulcanite *i. e.*, an," so as to make it read, "forming the plate and gums in which the teeth are inserted in one piece of hard rubber, or vulcanite, *i. e.*, an elastic material." Thus the patent was granted. In view of this there can be no doubt of what Cummings understood he had patented, and that both he and the commissioner regarded the patent to be for a manufacture made exclusively of vulcanites by the detailed process. We think this, to some extent at least, tends to confirm the conclusion at which we arrived in interpreting the patent by its own language. Indeed, we have heretofore expressed doubts whether re-issued letters-patent can be sustained in any case where they contain claims that have once been formally disclaimed by the patentee, or rejected with his acquiescence, and he has consented to such rejection in order to obtain his letters-patent.—(Leggett *vs.* Avory. 101 U. S. Reps. 256.) If these doubts be well founded, and the claim of the re-issued letters now before us be, what these complaints insist it is, a claim for the use of any other material than vulcanite, or some substance capable of vulcanization, another question might arise respecting the validity of the re-issue.

We have extended our remarks sufficiently upon this branch of the case. It remains to inquire whether the manufacture, by the defendant, of dental plates, out of the material known as celluloid, or solid collodion, is an infringement of the Cummings re-issue. We think it is not.

Celluloid is a substance of a comparatively recent discovery. Whether it was known at the time Cummings made his invention, or even at the time when his original patent was granted, we do not care now to inquire. It is sufficient for this case that we consider what it is. It is a compound of vegetable fibre, cellulose, or gun-cotton. Undoubtedly it can be employed for manufacturing dental plates, and a base for artificial teeth. Such a plate may have the fineness, lightness, and elasticity of a plate made of hard rubber by the Cummings process, but it is a substance very different from hard rubber and it is incapable of the same manipulation. It is not vulcanite, and neither it, nor its ingredients is capable of being vulcanized. It contains no sulphur or rubber. None of its constituents are vulcanizing agents. Camphor does not perform the function of sulphur. Under the action of heat its tendency is to soften the compounded mass rather than to harden it, as sulphur does rubber. When the ingredients of celluloid are compounded the product is hard, unlike caoutchouc, or gums generally, and heat softens rather than hardens it. When employed in manufacturing dental plates, the process is wholly unlike that employed in making hard rubber, or vulcanite plates. It is put into a mould it is true, such as was known and in use before the Cummings invention, but it is put in a hard state, in its natural condition, and not soft or plastic, and capable of being pressed around the teeth. The mould cannot be closed until heat is applied. When that is applied the jaws of the mould are gradually screwed together as the celluloid softens, and when the jaws come together the plate is completed. The process requires pressure in addition to heat, in order to reduce the plate to shape, and compress it around the teeth. There is no heating for hours, as is necessary in the vulcanizing process. The work is done in a few minutes. When allowed to cool it is the same hard and bony substance it was before its manipulation, and in this respect also it is unlike vulcanite. It is obvious from all this that neither in the nature of the material of which it is made, nor in the process of manufacture, which is an essential part of the Cummings invention, as we have seen, is the celluloid plate substantially the same as one made of hard rubber.

Nor is celluloid an equivalent for hard rubber, for the reasons already suggested, that it is not capable of vulcanization, and that it cannot be made a plate by the process prescribed by Cummings. It may be conceded the patentee is protected against equivalents for any part of his invention. He would be, whether he had claimed them or not. But when a product arrived at by certain defined stages or processes is patented, only those things can be considered equivalents for the elements of the manufacture, which perform the same function in substantially the same way. The same result may be reached by different processes, each of them patentable, and one process is not infringed by the use of any number of its stages less than all of them.

In view of these considerations we are constrained to rule that a celluloid dental plate is not an infringement of the Cummings patent. Celluloid is not an equivalent for the material which the patent makes essential to the invention, and in the use of it for a dental plate, the process which is inseparable from the invention, is not, and cannot be, employed. The decree of the Circuit Court is, therefore, affirmed.

ARTICLE IV.

Irregularities of the Teeth and their Surgical Treatment.

BY FRANCIS FOX.

Early decay of the teeth which marks the present generation is due, the author thought, to malnutrition occurring in the earlier periods of life. At about seven months after birth a process of absorption is set up in the walls of the crypt and parts superimposed, and by this process the crowns of the temporary teeth become visible above the surface of the gums. When the crowns of the teeth have erupted this absorptive action for a time ceases; and a renewal of the developmental process ensues, by which the alveoli are built up around the roots of the teeth. At about four years of age the temporary dentition is perfected, and soon after this perfection is reached absorption again sets in, commencing now in the roots of the teeth, and these, together with their alveola processes, are gradually removed, their permanent successors replacing them by a similar process of absorption of crypt and development of alveolar structures.

The important point to bear in mind is the fact that the alveolar portion of the jaws is developed with each dentition, so that a previous alveolar structure can have little to do with the position of the succeeding teeth, except as it may present an obstacle to their onward progress in consequence of its non-absorption. As to the development of the jaw bones, these bones consist of two portions, (1) an alveolar structure, developed with the temporary teeth, absorbed with them, and again re-developed with the permanent teeth; and (2) a basal portion. This base is more prominently marked in the lower jaw, in which the inferior dental canal very emphatically indicates the junction between the two portions of the bone. The base of the jaw when once formed remains in pretty much the same condition throughout life, except in advanced old age, when the muscles of mastication are no longer in full use, and then in a slight degree it becomes wasted. In the superior maxillæ at birth the alveolar processes descend but little below the level of the palatial plates, and the anterior and posterior parts are but little developed. As age advances the alveoli lengthens, the tuberosities increase in size, and an active development of bone takes place in these situations. The tuberosities are to the upper maxillæ what the coronoid processes are to the lower jaw. From these points the alveolar line is lengthened. In the lower jaw an alteration in the position of its articular surfaces and ascending rami, together with an absorption of the coronoid processes, accompanies the development of the posterior permanent teeth. The jaws elongates by additions to its posterior cornua. The capacity of the jaws in childhood is nearly equal to the anterior portions of the adult bones; for the ten anterior teeth of the permanent set in each jaw replace the temporary, and occupy the same position as these, so that this part of the jaw in adult life is pretty much the same as in childhood. If contracted then it will remain so throughout life, and no subsequent development in the posterion regions will tend to explain it. The replacement of the temporary teeth by their successors is effected by a purely physiological process, and is absolutely independent of pressure.

There seems to be a physiological law by which the cells composing the absorbent papilla in the neighborhood of a developing tissue have the power of absorbing a mature structure. That pressure has nothing to do with the process may be proven by the fact, that in cases where the shedding of the first teeth has taken place prematurely, a layer of bone has been observed to intervene between the crown of the advancing tooth and the base of the socket of its predecessor. At the time when the temporal teeth are about to be shed, in the well-developed jaw a decided separation between contiguous teeth is noticeable; and this circumstance is a fair indication of future regularity in the succeeding dentition, and a proof that this portion of the jaw has already been prepared to receive the larger permanent teeth. If the process of absorption continues uninterruptedly, the roots of the temporary teeth will be gradually removed, leaving little more than the shells of the crowns, which readily drop from the gum as their successors are in turn ready to occupy their places. But should any arrest in this process occur (and such is far from an uncommon circumstance,) these temporary organs are liable to offer considerable obstacles to the regular advance of their permanent successors.

The causes of irregularity in the position of the teeth may arise during the developmental periods of life, and are then due to a want of proportion in the size of the teeth and jaws, or to a faulty development of the jaw bones; or the displacement may depend on some accidental circumstances arising subsequently, such as the prolonged retention of the temporary teeth, the presence of supernumerary teeth, the habit of "thumb sucking," or the undue pressure from an hypertrophied tongue. There is abundant evidence to prove how frequently such deformity depends upon hereditary influences. The conditions of life to which our race has for many generations been subjected seems to have lessoned the necessity for the broad and well-formed jaws which were so characteristic of our ancestors, and for many years the advances in civilization have been marked by a deterioration in the capacity of our jaw-bones. Mr. Coleman, in some interesting investigations made several years ago, found that the percentage of contracted jaws was immeasurably greater in the children of the well-bred population than in those of less refined cultivation. The prolonged retention of temporary teeth is frequently associated with irregularity in their successors, and is probably often the cause of such irregularity. The presence of supernumerary teeth in the dental arch may prevent the normal members from assuming their proper places; but doubtless a disproportion of size between the teeth and jaws is of all causes of irregularity the most common. This disparity leads to a crowding of the teeth, sometimes to such an extent as to altogether prevent the eruption of some one or more of the dental series, such remaining impacted in the substance of the jaws. Certain injuries in early life may occasion displacement of the teeth, especially in the lower maxilla, such as the contraction of cicatrices about the face and neck. Mr. Salter, in his work on Dental Pathology and Surgery, treats the subject of irregularities of the teeth under two heads—(*a*) simple regularity, in which the misplacement is confined to one jaw, and is independent of the position of the teeth in the opposite jaw; (*b*) compound irregularity, which depends upon the position of the teeth in the opposing jaw.

In "simple irregularity"—that is, where the misplacement is confined to one jaw—the crown only of the tooth may be irregularly placed, the apex of the root retaining its normal position; or the entire tooth may be displaced, or faulty in its development. Such irregular teeth are often entirely removed from the dental arch, and may be impacted in the substance of the jaw-bones. In the former condition, when the apex of the root retains its normal position, much good may be effected by judicious treatment, but in the latter case little can be done to remedy the evil, except by the removal of the displaced tooth. As examples of "simple irregularity," we may mention the appearance of the upper canines above the alveolar ridge, or in the palate, owing to insufficient room for them in the dental arch. An early loss of their predecessors, by permitting the first bicuspid and the lateral incisors to approach each other, is not unfrequently the immediate cause of this displacement. Sometimes, however, the retention of the temporary canine, or the presence of a supernumerary tooth, will occasion its deformity.

An overlapping of the incisors is another form of "simple irregularity," and frequently requires for its treatment a resort to some mechanical appliance in order to obtain regularity in the position of these teeth. Another not uncommon form of irregularity is where an incisor tooth is more or less twisted. sometimes to such a degree that the side of the crown will occupy the position of its anterior surface. A forcible twisting of the tooth into its right position is very generally adopted. Some, however, are averse to this prompt treatment, and suggest the employment of a plate carefully adjusted to the palate, and having certain properly constructed points of resistance. An unsightly separation of the central incisors in the upper jaw sometimes occurs, and the teeth may be readily drawn together, but have a great tendency to return to their former position.

In treating these cases, great care should be taken to prevent the ligature from slipping below the edge of the gum—between the necks of the teeth and the gum—for the irritation set up by such a mishap has been known to cause the death of the tooth. In order to prevent this displacement of the ligature, a small vulcanite plate may be constructed, to which the ligature can be attached, and thus prevented from shifting its position. The second form of irregularity of the teeth—that depending upon the position of the teeth in the opposing jaw—is much more complicated. As an example, might be cited the "underhung jaw," in which the "bite" is intersecting; some, or all of the six front upper teeth being shut behind the corresponding teeth in the lower jaw. This condition, in its extreme extent, arises from an undue development of the lower over the upper jaw, or from a want of development in the superior maxillary bones. It may also arise from a retardation in the eruption of the superior incisors, or by these teeth being pushed inwards by the prolonged occupation of the dental arch by their temporary predecessors. An early treatment of this irregularity is all important, and should consist in preventing the contact of the opposing teeth.

An opposite condition of the lower jaw sometimes occurs, in which the lower incisor teeth bite close up to the palate, so that they press against the necks of the upper teeth, and push them forward. A separation of the teeth in the anterior portions of the jaws has been described, and is occasioned by a congenital malformation of the lower jaw. The early obliquity in the position of the ascending rami is unduly maintained, and there is a want of development in the alveolar portions of the jaw, especially in the regions of the molar teeth. This irregularity may be caused by the contraction of a cicatrix in the throat or neck. The bicuspid teeth are not infrequently misplaced, and, when so, they usually occupy a too inward position. This may arise solely from their having been prevented from assuming their proper positions in the dental arch by the prolonged retention of the temporary molars. But usually it is dependent upon a diminished capacity of the jaw, and in the upper jaw is generally associated with a projection of the incisors, and a more or less elevation of the palate constituting the V-shaped jaw, or "rabbit-mouth." This malformation is congenital, but, except in very exaggerated cases, is not very manifest until the posterior permanent teeth are about to be erupted, when the additions to the superior maxilla have been made in the posterior regions.

The newly-formed bone, which has been gradually developing, is now found to be placed at an angle with the preexisting alveolar line. This abnormal development has arisen in order to effect an harmonious arrangement with the other bones of the cranium. The maxillary bones having been imperfectly developed during early childhood their posterior borders not being sufficiently divergent, the subsequent additions for adult confirmation are placed in a wider circle; hence the point of junction between the two parts (the old and the new, so to speak,) is marked by an angle of more or less extent. It is usually associated with great delicacy of constitution, and may occur in those of weak mental powers, but is often observed in persons of great intellectual capacity. The treatment of these cases consists in endeavoring to gain increased space in the dental arch, and to diminish the projection of the upper front teeth; but is, as a rule, more or less unsatisfactory. Irregularity in the wisdom teeth is sometimes met with, and may occasion most serious mischief, when extraction is the remedy. Transposition of the teeth is rare, and is usually met with anteriorly; and also inversion, which is still rarer.—*London Lancet.*

Ohio State Dental Society.

The following was adopted, by a rising vote, at Columbus, December 9, 1880, and ordered sent to all the dental journals.

W. H. Sillito,
Rec. Secretary.

IN MEMORIAM.

Since our last annual meeting, and shortly after its adjournment, the practitioners of dentistry throughout the civilized world were shocked and saddened by the announcement of the death, at Paris, France, from congestion of the brain, of our esteemed friend and co-laborer, Dr. Samuel S. White.

Although distant from home, his last hours were cheered and the bitterness of death was mitigated through the loving ministrations of a son and daughter—who had accompanied him.

When the cable transmitted the intelligence of his death, many hearts were burdened with grief in sympathy with his bereaved family.

No words eulogizing Dr. White are needed here. His career is known to us all—a noble life. The sterling character of the man; the uniform worthiness of his aims; his energy and industry; his conscientious, earnest and persistent endeavors to benefit the dental profession, his upright and generous dealing, furnished an example worthy of imitation by us all. A record of his manliness and worth is engraved upon the hearts of all who knew him, and deepest in the memories of those who knew him best.

Cherishing appreciative and affectionate remembrances of our personal and professional relations with Dr. White, we desire to assure his family of our unfeigned sympathy with them in their affliction, and place on record this testimonial of a sincere esteem and love for our departed friend.

F. H. Rehinkle,
J. Taft,
G. W. Keely,
Committee.

American Academy of Dental Science.

The annual meeting of the American Academy of Dental Science was held October 27, in the lecture room of the Boston Society of Natural History at half past ten A. M. President J. L. Williams in the chair. The annual address was delivered by Dr. Joshua Tucker, of Boston; it contained important results of more than forty years experience. Theories of decay and results from extracting teeth from crowded arches were among the important topics discussed. Dr. Brackett, of Newport followed with a paper on "The one thing needful to preserve filling." Discussion followed on the subjects of the address and essay by members of the Academy. It was voted that the thanks of the Academy be tendered Drs. Tucker and Brackett for their valuable essay. The annual dinner was served at Hotel Brunswick in the evening. The following offisers were elected for the ensuing year:—

J. L. **Williams**, *President*; J. H. **Chandler**, *Vice President*; J. T. **Codman**, *Recording Secretary*; C. P. **Wilson**, *Corresponding Secretary*; L. D. **Shepard**, *Treasurer*; H. F. **Bishop**, *Librarian*; E. G. **Tucker**, G. T. **Moffatt**, F. N. **Seabury**, *Censors*.

C. P. **Wilson**, *Cor. Sec'y*.

EDITORIAL, ETC.

The Goodyear Dental Vulcanite Company.—Watchful eyes, it is said, are on this long time monopoly, and it will be seen to that their application for an extension of the Cummings' patent is hotly contested. It behooves every dentist to see to it that the member of congress for his district is thoroughly posted as to the merits of this case, the injustice of the cause of the company and the importance of the question to the dental profession. We may rest assured that the company will well represent their side of the case, and it should be well taken care of by the dentists.

Since the above was written a mass meeting of the dentists of Baltimore has been held, a report of which we append as published in one of the daily papers of that city. It behooves all who feel interested in the subject, to act promptly and vigorously, for it is evident that the vulcanite company intend to use all means to gain the extension of the patent held by them. Let each dentist who has a member of congress for a patient, use what influence he has to post him on this subject.

H.

"Maryland Dentists and the Vulcanite Patent.

A meeting of dentists of the State was held at the Dental College, Lexington and Eutaw streets, last night, in order to inaugurate a combined effort to prevent the extension of the patent of the Goodyear Dental Vulcanite Company. Dr. Henry H. Keech was chosen chairman and Dr. R. B. Winder was appointed secretary. Dr. Winder urged upon the meeting the importance of defeating the proposed extension of the patent, and said that dentists were paying license fees to the Vulcanite Company ranging from $75 to $1,000. He said that it was essential that full statistics bearing upon the subject should be gathered, collated and presented to Congress. Dr. F. J. S. Gorgas, T. S. Waters, E. P. Keech and others discussed the subject. It was stated that the Goodyear patent was thirty years old, but that for ten years past none but dentists have paid any royalty thereon. If the matter was properly presented to Congressmen it was believed the profession would be relieved also. A committee, consisting of Drs. F. J. S. Gorgas, E. P. Keech, S. T. Henkle, C. E. Duck, T. S. Waters and H. H. Keech was appointed to prepare and present a statement of facts in connection with the matter to the representatives of Maryland in the Congress of the United States. The meeting adjourned subject to the call of the chairman."

Diamond Instruments.—The discovery that carbon points could be used for stone-cutting revolutionized that art, and rendered the boring of tunnels through granite mountains an easy task. It is safe to say that no advance in stone-cutting so great has been made since the gang-saw was invented. Carbon points for turning down hard steel rolls reduce these with an exactness and facility heretofore impossible. Most dentists are familiar with the "diamond disks" for separating, polishing, &c., and are aware how they take the place of the thick and fragile disks of corundum. Mr. S. Dessau, of New York, has made lately some very superior disks of this sort, and also some shapes hitherto unused. One of these he calls a diamond point. This is about the size of a silver five cent piece, and about the thickness of two nickels, and is the most useful cutting instrument of the kind we have had for a long time. For cutting down cusps of teeth that are in the way, for grinding off ragged edges, cutting down fillings, and especially for completing the articulation of artificial teeth at the final fitting in, it is indispensable;

and it is hard to see how it has so far been done without. We had fancied that it would soon wear away and become smooth, but the copper seems *saturated* with the crystals, and after a month's use it cuts as well as ever. At the cost price, if this instrument only lasted a week, it would be cheap enough. A small and very neat diamond drill is also made, useful for forming cavities in artificial teeth, and for making depressions in their crowns in cases of difficult articulation. H.

BIBLIOGRAPHICAL.

Walsh's Physicians Call Book has been used for some time by us as an *appointment book*, answering well for that purpose, and containing a mass of information valuable to all. The table of metric doses as proportioned to the ordinary system, is very useful. It is, in addition to being an excellent blank book, a perfect compendium of what most physicians and dentists would like to have at hand continually. H.

MONTHLY SUMMARY.

Alloys and Solders.—Alloys employed for joining metals together are termed "solders," and they are commonly divided into two classes; hard and soft solders. The former fuse only at a red heat, but soft solders fuse at comparatively low temperatures.

Of mixtures of metals which become liquid at temperatures at or below the boiling point of water, there are several known, some of which are placed in convenient order as follows :

1. *D'Arcet's* : Bismuth, 8; lead 5; tin 3 parts. This melts below 212° Fah.

2. *Walker's*: Bismuth 8; tin, 4; lead, 5 parts; antimony, 1 part. The metals should be repeatedly melted and poured into drops, until they can be well mixed previous to fusing them together.

3. *Onion's*; Lead, 3; tin, 2; bismuth, 5 parts. Melts at 187° Fah.

4. If to the latter, after removing it from the fire, one part of warm quicksilver be added, it will remain liquid at 170° Fah., and become firm and solid only at 140°

5. Another: Bismuth, 2; lead, 5; tin, 3 parts. Melts in boiling water.

Nos. 1, 2, 3, 5, are used to make toy spoons to surprise children by their melting in hot liquors. A little mercury (as in 4) may be added to lower their melting points.

Nos. 1 and 2 are especially adapted for making electrotype moulds. French cliche moulds are made with the alloy No. 2. These alloys are also used to form pencils for writing. Also as metal baths in the laboratory, or for soft soldering joints.

The following are the best receipts for the common solders:

Hard spelter solder: copper, 2 parts; zinc, 1 part. This solder is used for iron-work, gun-metals, etc.

Hard silver solder: silver, 4 parts; copper, 1 part; or silver, 2 parts; brass wire, 1 part. These are employed for fine work; the latter is most readily fusible.

For *brass-work*: equal parts of copper and zinc; or, for the finer kinds of work, silver, 1 part; copper, 8 parts; zinc, 8 parts.

For *steel*; silver, 19 parts; copper, 3 parts; zinc 1 part.

For *pewterers*: bismuth, 2 parts; lead, 4 parts; tin, 3 parts; or, bismuth, 1 part; lead 1 part; tin, 2 parts. The latter is best applied to the rougher kinds of work.

For *jewellers*: fine silver, 19 parts; brass, 10 parts; copper, 1 part; or, for joining gold: gold, 24 parts; silver, 2 parts; copper, 1 part.—*Druggists Circular.*

The Tasting Power of the Tongue.—The tasting power of the tongue is not regularly distributed over all parts of that organ. According to the unanimous judgment of physiologists, the back part of the tongue is best qualified for this function, while there is a difference of opinion as to the tip of the tongue. The old observers have repeatedly said that a tasting power in the tip is limited to certain persons, whereas more recent ones affirm its presence in all men. In experimenting on the so-called "reaction time," Herr Vintschgau lately met with a case of limited tasting power in the tongue-tip, and this led him to a thorough investigation of the subject. The observations were made with solutions of chloride of sodium, sugar, quinine, and citric acid. The results were as follows: There are persons who are capable of accurately distinguishing all principal tastes with the tip of the tongue alone; others perceive with certainty the qualities of sweetness, saltness, acidity, but less distinctly bitterness; others again can only with great difficulty distinguish tastes with the tip of the tongue; and finally there are individuals who cannot do this in the least.—*Drug. Circular.*

Cervico-Bronchial Neuralgia Cured by Extraction of a Wisdom Tooth.—On the 18th of February I was consulted by a patient who was suffering from severe neuralgic pains in the left temporal region of the head, and extended to the neck and arm on the same side. The patient described the pains in the neck and shoulder as being so severe as to interfere with the use of his arm.

Judging the pain in the temporal region to proceed from reflex irritation of the "auriculo-temporal nerve," caused by its connection with the "inferior dental," both belonging to the third division of the fifth pair of nerves, I determined to extract a decayed left lower wisdom tooth, and on doing so completely relieved all pains, The pulp of the tooth was in a state of chronic inflammation.

Now, although the implication of the cervical and brachial plexuses in neuralgia caused by carious teeth is a fact well known to dental surgeons, I have never been able to obtain a satisfactory reason how it is that these nerves, which are spinal, should be affected by irritation of the maxillary nerves, which are cranial.

While perusing my anatomical studies on the head and neck, I made it my business to endeavor to find out any communication which might exist, either normally or abnormally, between the maxillary nerves and the cervical and brachial plexuses, but could trace no connection at all, and to the repeated and persistent questions which I put to the demonstrator of anatomy on the subject, I could get no more satisfactory answer than, "We know the sympathy between these nerves to be a practical fact, but have no means of accounting for it."—*Musgrave, in British Journal of Dental Science.*

Anæsthesia by Rapid Respiration.—Dr. Benjamin Lee relates in the *Phila. Med. Times* several cases in which an analgesia effect was produced by rapid and forcible respiration. It is a method that has been employed successfully for some time by Dr. Bonwill, a dentist of Philadelphia. Dr. Lee's cases were those in which abscesses were opened or teeth extracted. Analgesia was not produced in every case, but it was brought about often enough to show that the effect is a genuine one. The respirations have to be kept up for a minute or more.

Fetid Sweating of the Feet.—A simple and effective method of dealing with that annoying infirmity is suggested by a correspondent of the *British Medical Journal.* He says:—

All that is necessary is to strap the affected portions of the sole of the foot as smoothly as possible with tolerably wide straps of ordinary adhesive plaster—either emplastrum saponis or emplastrum plumbi. Every part should be completely covered, and with two layers of plaster if the complaint be very bad. The plaster should be taken off and renewed in three or four days, and once again at the expiration of a week, when the skin will be found to be quite healthy, having its normal yellowish appearance, and will also be quite dry. The odor ceases from the first application, and the patient will walk away in comfort. One may with confidence predict, even in the most severe case, a perfect cure in the time mentioned.

There seems to be in some persons a tendency to relapse after an interval of some weeks; but on the slightest sign of reappearance of the disease, it is only necessary to cover the patch with a single strap of plaster, which will at once arrest its progress, remove the fetor; and speedily exert its curative influence.—*Med. and Surg. Reporter.*

Keeping Rubber Plates Clean.—Dr. N. W. Kingsley is reported as having said that one of the greatest disadvantages of rubber plates is "the impossibility, almost, in ordinary hands, of keeping rubber absolutely clean;" that out of a thousand sets that came into his hands after having been worn, but one was absolutely clean. He believes the absence of cleanliness to be the cause of the sore mouths we occasionally met with. Although the statement is rather broad, I believe it to be in the main correct, and I think I can point out the reason why: not one set in twenty is properly hardened in vulcanising; consequently the polish wears off easily, and then to keep such a set clean is impossible. A set of teeth vulcanized at 320° for fifty-five minutes as recommended by the manufacturers is not fit to enter anybody's mouth. On the other hand, a set of teeth well hardened and highly polished can be kept clean as easily as a gold set, and far easier than celluloid.—*Guttman, in Dental Cosmos.*

The Dangers of Chloroform.—Two deaths following the administration of chloroform for medical purposes have recently occurred; one, that of a lady of Liverpool, took place in the surgery of a dentist, the deceased being described by her regular medical attendent as of "sound constitution." No blame can possibly be attached to any one, but the accident serves to point to the necessity for abandoning chloroform in favor of some anæsthetic not so often attended with fatalities.—*Medical Press and Circular.*

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ARTICLE I.

Proceedings of Maryland and District of Columbia Dental Association.—Annual Meeting.—(Continued.)

Discussion being in order, Dr. Winder took the floor and said:—

Mr. President, this Association can only feel highly gratified by such a paper, and is forced to indorse the truths contained in it. This mode of filling prevents, in mastication, food getting between the teeth. It not only does that, but it certainly keeps the necks of the teeth apart, allowing saliva to pass through and wash thoroughly. The only criticism I can possibly make is, that probably the form of the tooth has more to do with its protection than the structure itself. I believe that a set of teeth up to the morphological law will stand better than a set of teeth not so well formed but of better quality

We find them almost a plain surface from the cervical to the cutting edge; the plain flat surfaces coming in contact with each other.

I do not know what Dr. Webb would do in this case. If all teeth were up to the highest condition, I think there would be but one opinion about this matter. Of course, in the study of the preparation of the mouth for the final end, the object naturally would be to bring that mouth as near the high type as is possible to do it. But it is very often almost impossible to bring a mouth up to the highest type. I have personally to thank Dr. Webb for the paper. I think it one that we should be very glad to accept, because in my opinion it represents the most advanced progress in the mode of filling teeth.

Mr. President.—I would just ask Dr. Webb to make a statement in regard to the question Dr. Winder asks.

Dr. Webb.—I would there restore also, and make the margins free. I would more than restore, if necessary, to make the margins free.

Dr. Donaldson.—I would much rather, this evening, hear other gentlemen express opinions upon this subject than to attempt to discuss it myself. I fully admit what Dr. Winder has stated in regard to the "highest type" of teeth but, as he says, we rarely meet with these highest types of teeth where the necks are separated considerably, while the crowns touch at a mathematical point. If all the cases met with in our practice were of that kind, there would be no diversity of opinion as to the correctness of the practice advocated by Dr. Webb; but I must differ with him when he states that his mode of practice is best in *all cases*, because my own experience satisfies me that such is not the case. I do not like the plan suggested by Dr. Webb of enlarging the whole or a part of the arch, and keeping the neck of the teeth apart by contouring when they were not so naturally. In cases where the molars, bicuspids and canines all come together from the masticating surface to the gum—and are all decayed upon the approximal surfaces, and we often meet with such cases, by pursuing this plan of operation the whole arch would be considerably enlarged, and in many cases the articulation of the teeth would be interfered with, and consequent discomfort to the patients would follow.

There are other objections to my mind, to this practice, one of which is the inability of so many of our patients to pay for such operations, to say nothing of their unwillingness to bear the fatigue, pain and discomfort consequent upon the performance of them.

We all contour teeth with gold occasionally, and theoretically, the system advocated by Dr. Webb, would seem to be correct, but practically it must be departed from in a great many instances if we would preserve the teeth of many of those who claim our services. In my own practice I have used, and continue to use cohesive gold in some cases, and sometimes I contour teeth, but most of my filling operations are performed with non-cohesive foil (Abbey's soft,) and my experience is that I can best preserve the greater portion of the teeth I meet with in my practice by using this form of gold.

Dr. Webb.—I take it in many of these cases where teeth come flatly in contact they are of first class structure. I do not mean that the arch should be enlarged. If we go beyond the margin of the gum, we find that the tooth narrows down. If the cavity be prepared above the margin of the gum, we find that there will be space at the neck, and the margin can be made free. This is on theory. It is the result of close, careful observation; it is the result of practice in a place of 25 or 30 thousand.

If time, opportunity or means are not afforded for such operations the teeth should be kept in condition with soft fillings until time does present itself.

If cohesive gold is properly manipulated, I do know that it can be placed better than soft foil.

Dr. Donaldson.—How many children of the people who are in ordinary circumstances would preserve their teeth until they grew up, if they had to be filled with cohesive gold and built out? I like to see work such as I have seen of Dr. Webb's; I admire the skill he displays; I admire his interest in the profession which brings him to dental meetings throughout the country, and incites him to prepare such papers as we listened to to-night, but at the same time I am forced conscientiously to differ with him in some of his positions.

My own practice is exclusively amongst families that I attend to year after year. I have the teeth of those families in my charge. I could not "contour" all the teeth that come to me needing to be filled, and do my duty. I do not want the members of this Association to look upon me as one standing in the way of true practice in my profession, but these things I say conscientiously, believing them to be true.

Dr. Smythe.—There is one thing that Dr. Webb does not take into account, and that is, that there are few men in the United States who have his manipulative ability. I do not say it in flattery. I honestly think there are very few men capable of putting in fillings, such as I have seen put in by Dr. Webb. It would be a nice thing if all men in the profession would do it, but it is impossible to have it so. I take exception to Dr. Webb when he says teeth cannot be separated and saved, because I have seen fillings in the mouth saving the teeth for 30 and 35 years,—separated teeth and soft gold. If we could all work as well as Dr. Webb we would contour as far as our means would allow us.

Dr. Winder.—We all admit that it is much more difficult to perform an operation thoroughly with co-hesive than with non-cohesive gold—at least that is my experience But you have all met with fillings, so imperfectly packed with so-called soft foil, that you could easily stick an excavation through the filling, and yet year after year these fillings seem to preserve the teeth—In these cases it would seem that the gold had never been well consolidated, and yet the teeth are preserved—this to me has always been a mystery. I agree with Dr. Webb that cohesive gold can be as thoroughly adapted to the cavity walls, but I think it requires more skill and care. The question of contouring or not should always be governed by the morphology of the teeth, and when teeth come up to the highest morphological type they rarely decay.

Dr. Atkinson.—Mr. President and gentlemen, this is a subject of the success of our lives, and, if we understand it thoroughly there will be no difference of opinion more than there is about mathematics. I want to say something about this subject of heat. An admirable instance came to my mind when Prof. Winder spoke of the fillings put in by Dr. Maynard, and they were solid. When we first began to anneal gold for the purpose of drying it, we made it solid without knowing why. Prof. Winder asks why teeth are preserved so long by fillings so soft that an excavator can be put through them?

That is just like a thousand and one mistakes we make by rushing at conclusions.

He assumes that the filling was the preservative of the tooth which I doubt is true.

Repeatedly have I seen teeth excavated and filled, and the others not, where both were being preserved. I remember a case in the days of stage travelling—a lady was in the chair for the purpose of having the central incisors filled. They were prepared, and one filled when the stage drove up, and she could not sit to have the other filled. I saw her well on to 25 years afterwards. The teeth were of a good class, good morphological form, and good arrangement.

Those incisors were worn down, and only one-third of the length of the cavity that was prepared was left—a crescentic shaped cavity, and the one that was filled was worn down gold and all.

At that time the question arose in my mind that seemed to puzzle Prof. Winder, how it was that the tooth not filled was preserved as well as the other, and it was that the protoplasmic cells are calcified.

And this preservative process that we know nothing about is probably, the thing we want. We jump at conclusions too much.

In filling teeth it is not so much the material we use it is the manner in which it is done. Anyone that unde stood the paper read to us, need not go a step beyond that it is as simple as the multiplication table. If those sla like teeth that are so very hard were decayed, and the have their thick necks, I would fill them so as to knuck the gold against gold, and then I would not build it qui out at the neck. Now why? So that the festoon of the gu shall have room enough to come down in such mass as fill that up, and prevent food from getting in there. No about fissures. If you find a simple cavity in a tooth, even evidence of decay, no matter how slight, do not tru it; cut out those fissures and fill them religiously with an gold with which you can make a solid filling. If a child mouth is treated in this way, in a great majority of case you will never have anything more to do than to keep h teeth clean. I have seen beautiful fillings and signs calcareous deposits on the teeth. Do you call that finished Keep the teeth clean, and the souls will be kept clean.

Dr. H. B. Noble then read the following paper on Ope ative Dentistry:

In the writings and discussions upon filling teeth, th idea seems general, that one must use either cohesive non-cohesive foil, and each, to the exclusion of the other each particular case or filling. In the jurisdiction of th Society there are a large number of our best men usin both cohesive and non-cohesive foil in the same cavity; ye very little is said about it in discussions at our meeting and their combined use seldom advocated in our publi gatherings, lecture rooms, or in our dental journals; that the student, or young men scarcely catch the idea, are instructed in this manner of operating.

I believe that a large number, probably a majority, cavities can be best filled by the use of both cohesive an non-cohesive foil, placing the soft or non-cohesive foil ne to the walls of the cavity, as it can be more easily an certainly brought in perfect contact, as the ribbons, or cylinders of gold slide upon, or into each other with comparatively little force; but if the gold be cohesive, each little particle or piece adheres to its neighbor at irregular points, forming thousands of arches, that have to be broken down, either by blows or pressure, before perfect union or contact can be had. When the walls of the cavity have been covered, and the larger portion of the cavity filled, non-cohesive foil of such shape as may best suit the operator, or cavity, (generally ribbons;) we begin the use of cohesive foil with very small ribbons, and by the use of small points forcing it into the soft foil in every direction, and at all points anchoring it thoroughly into the soft foil, working up any depression until we have an even uniform surface, which can be built to any desired shape or size.

Soft foil acts as a kind of cushion to protect the tooth from the jars of the mallet, which in sensitive or weak teeth may be of great advantage, also lessening the danger of sore, lame teeth, in a long protracted operation.

After reading the paper Dr. Noble said:—

Mr. President, this has been our practice for many years and we are very loathe to give it up entirely. We have not only seen teeth where the fillings were put in with soft foil, but we have also seen such as Dr. Winder mentioned.

I have seen fillings put in by Dr. Maynard 45 years ago preserving the teeth perfectly. I have been using the combination of tooth foils, and I am satisfied in a great many cases (I believe I am not alone) that we can use the soft foil next the walls of the cavity, and still get a hard surface with the cohesive gold. I think gold can be brought more perfectly in contact with the walls of the cavity, if the non-cohesive form is used.

Dr. Webb.—Mr. President, there are several points to which I wish to refer. In the first place we ought not to have any little arches to break down. Gold should be cut into small pieces, and placed where it wants to be when in the cavity, and malleted down. The class of teeth referred to in reference to filling the bottom with non-cohesive gold so as to give a cushion, should have the phosphate of zinc in the bottom instead. In all cases where the cavity is deep, some form of zinc filling should be placed in first, to serve as a base for the proper shaping of the cavity. I have seen cases where the fillings have been put in, in the manner described, where the bottom was filled up with so-called soft foil, and then the surface finished with cohesive gold. The teeth wear down, after a while, and leave the non-cohesive gold, which does not stick together, and will peal off, and we have a filling that is not good. In the case of these fillings, put in 40 years ago, as Dr. Atkinson stated, the gold was made cohesive without the operator being aware of it; we find that most all of these fillings are upon the grinding surfaces, and upon the proximal surfaces, with the next tooth missing. Operators at that time did not attempt to perform the operations that are performed to-day.

In reference to the matter of its being easier to put in soft foil fillings, than with cohesive gold; that is a matter misunderstood; those who only occasionally put in cohesive fillings, cannot do it as well as others, who do it every day. I will state here that I know operators under 30 years of age, who are among the finest in the world to-day, and who do use cohesive gold; each of them to whom I refer has a large practice. How did they do it? They were not known before they commenced practice. They did it, because they did all their work well.

Dr. Noble.—I do not want Dr. Webb to think we put our cohesive gold *on;* we put it *in*, and if it is put there properly, there is no peel to it any more than his cohesive fillings. I have lost two valuable teeth, filled by good operators, with cohesive gold, and that started me on the other side. I desire to thank Dr. Webb, and have him feel my unbounded admiration for a man, who would do what he is doing by going around, and doing his best. If he can convince me that his practice is the correct one, I think I will fall right in and do it.

Dr. Donaldson.—I hope Dr. Webb will not fall into the error of supposing that we in Washington, do not believe we perform good operations, because we cannot get the money for them. I do think we perform good operations.

The President.—When we speak of non-cohesive foil, we mean there is something on the surface of it, making it non cohesive. All gold, that is manufactured from pure gold is cohesive gold.

Dr. Noble.—That point was carried at the meeting of the American Dental Association, in Philadelphia, and was flatly denied by the Abbey manufacturers; men of our profession were taken to Mr. Abbey's manufactory to watch the whole process.

Dr. Winder.—Leslie said that all gold as it came from the manufacturers hand was cohesive, and stated that he dipped his gold into a solution, to make it non-cohesive.

Dr. Noble.—That was so, but then there was another man, I think it was Dr. Kingsbury, who said it was not so

Dr. Atkinson.—Mr. Abbey has a peculiar form of Vellum which has red ink, of some kind, on it that may effect the gold, thus making it non-cohesive.

Dr. Hodgkin.—I can hardly think the conclusions arrived at are correct. Abbey's soft foil is not susceptible of being made cohesive by heating, while the others are to a great extent.

The President.—Has any one passed a piece of foil through an acid, and tried to make it cohesive? That would probably be a good test.

Dr. Webb.—If teeth are injured by malleting, it is the fault of the malleting. Malleting must be done properly, and I do know if it is done properly, a filling may be malleted for an hour, and the teeth not be sore afterwards. When I state that I often use from one to two, or three books a day, it will indicate to you that I have had some experience.

The President, stated that the Executive Committee had made arrangements for a clinic the following morning.

On motion of Dr. Winder it was ordered that the morning session be dispensed with, in order to allow the gentlemen more time for their clinics.

On motion of Dr. Winder the rules of the Society were suspended, and Drs. Webb, Baker, Underwood, and Reese were made honorary members.

On motion the subject of Operative Dentistry was passed, and the meeting adjourned.

ARTICLE II.

The Literature of Dental Mechanism.

BY PROF. HODGKIN.

The volume before us * is the only American book on Dental Mechanism, or as Prof. Richardson prefers to term it, Mechanical Dentistry. It has stood for years as a text book in the dental schools, and, excepting the excellent division on this subject in "Harris Principles and Practice," by the late Prof. P. H. Austen, has no competition. The publishers have lately brought out a new edition of this work, containing many new things, some perhaps more properly belonging to Dental Surgery than to Mechanism, as those subjects are commonly classed; and the volume is thus increased in size considerably.

The revision of an old book would seem a more difficult task than its original composition. At least so we take it in looking at the work of this sort which is done from time to time. Whether a volume after being accepted as a text book acquires a sort of sanctity which is in itself inhibitory, or whether it is that the writer feels loth to change what is once written; or, whether authors, like other people, hesitate to change, lest they should be suspected of weakness, it is difficult to say. But it does seem as though that plasticity of opinion which in the rapid advance of dental and other sciences leads to new views and modification of old views, is not a characteristic of revisers. We are compelled usually to go to the new *books*, not to the new editions of the old books, for the latest light. True it is that text books such as this are of necessity behind the times, for even the most rapid compilations and recent condensations from journalistic literature grow musty and are left behind, whilst the volume is yet in the hands of the printer and binder; and the works become, even in the present, a thing of the past.

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*"A practical treatise on Mechanical Dentistry, by Joseph Richardson, D. D. S., M. D., Prof. in the Indiana Dental College, etc. Third edition, revised and enlarged. Philadelphia, Lindsay & Blakiston 1880."

Yet this should not excuse a book-maker from the most rigid scrutiny of what is already written and which has stood before the public as an index of truth, to guide seekers after knowledge; and when a new edition is in progress, it is not enough simply to *add to* what is already printed. Expurgation and emendation is no less the duty of the editor—often the most important duty—than addition; and in all fairness to Prof. Richardson, this we claim, and hope to show, he has not done. Of course it is easy to criticise and find fault. We only hope to show that errors such as are made, are grave defects in a text-book, in which young men are searching for the best and most carefully thought out precepts and doctrines, and in which no information easily accessible should be incomplete or incorrect.

Somehow we cannot help feeling that Prof. Richardson has hardly made practical use of all which is put down in this book as useful. The description of the apparatus of Mr. Fletcher, of England, is evidently copied from the vauntings of that highly egotistical gentleman, who turns out from time to time things newer than his newest, only to find that his *last* is just the thing. Long ago, in a book most tersely written, and *par excellence*, full of original thought and original research—we may almost say the only original writer on these subjects—Prof. Austen suggested the addition of a flexible tube to the mouth blow pipe, and of a cigar-holder as a mouth piece. And he seems to have been the only man to give a philosophical description of the proper terminal point or tip of this instrument,—that it should terminate in a perfectly parallel-sided tube or cylinder, smooth and polished within; and he further suggests the straightening of the curved end, which Prof. Richardson claims, or allows Fletcher to claim, as original. It is not probable that an original investigator would fall into such apparently small errors as these; nor would one who examined and studied all things with the mathematical criticism of Austen have said, "it is *claimed* that with the use of this instrument," etc. We must say, even at the risk of being considered harsh, that in such matters only the personal investigations of the writer carry with them conviction—the "claims" of the inventor should be set aside, and only personal knowledge recorded; and this for obvious reasons.

For the benefit of young men, and the more especially in this day of "plastics," when a vulcanizer for artificial dentures, and a spatula for filling, constitutes an outfit, mechanical and operative, and when the blow-pipe is a purely theoretical instrument, it is worth while to say that the immense and urgent blast and heat of the new forms of apparatus are really not essential in soldering. No more beautiful soldering can ever be done in the future than has been done in the far past, with a simple mouth blow-pipe and an old fashioned oil or alcohol lamp. The most ingenious device will only supplement—not take the place of skill; and if this is acquired, even the indifferent and commonplace tools are given dignity and excellence; are capable of producing results little short of marvellous. When once the "how to do it" is acquired, simple means will ordinarily suffice.

It is unfortunate to refer as reference, to a book now out of print, as is done on page 40. Piggott's Dental Chemistry is unfortunately no longer purchasable; it is a book full of reliable information on such subjects as are referred to by Prof. Richardson; and no more valuable contribution to scientific study in dentistry could be made, would some one qualified re-write it up to the latest state or phase of chemistry.

It seems a singular omission that in the treatment of the subject of gold, its most commonly associated metal, silver, should be omitted. It is rarely absent in the gold mined from our chief sources, California and Australia; and the facts that this metal is very malleable, ductile, unoxydizable by heat, etc. are not those which "make it peculiarly fit for the purposes to which it is applied in dental prosthesis." It is the tested behavior of a substance *in the presence of the oral secretions*, which determines its fitness, or the reverse; and this, whether it be a filling or a plate. And with regard to the question of its malleability (p. 44) Makins is authority for saying that gold alloyed with copper or with silver (but not with both) is more readily beaten than the pure metal.

The chapter on refining gold is hardly sufficient by explicit, and a simple though important and effective method of separating the mechanically mingled impurities, and base metals, as well as silver scrap, is not noticed. Nitric acid will, in addition to dissolving out the iron sought to be rid of by the use of the magnet, take out all other mechanically mingled metals capable of solution in it, and by washing out the soluble nitrates, a simple means of preliminary purification is had. A magnet is apt to entangle filings of gold along with the iron it may attract. Mercuric chloride is, according to the best authorities, a wasteful salt for purification, as, along with the volatilized mercury is carried off an appreciable quantity of gold. It is never used by specialists; but chlorine gas, which Prof. Richardson does not mention, is used with great advantage to toughen gold.

Now that graphite crucibles are so largely used, it is proper to say that their use is not practicable in dry refining, this material hindering oxydation. The "wet process" for refining gold is fairly stated, but much more minute instructions would be necessary to enable a novice to perform this delicate and somewhat complex chemical process. In fact we have seen but one work by the aid of which a student could conduct these manipulations intelligently, and this is Makins' Metallurgy, an English work. No one who wishes to study metallurgy can dispense with this book. It is well to know, what is not mentioned in the book under review, that the troublesome accumulation of fluxes, glass of borax, etc. on the top of the molten metal in the crucible may be readily removed by the use of bone ash, which acts here as a sponge.

On the question of alloying gold plate, the student will be likely to draw the inference that copper is injurious, whereas the fact is it takes less copper to produce the requisite degree of hardness than of silver. Twenty carat gold plate in which the alloy is copper, will not tarnish in most mouths. But in many cases—more than may be supposed—gold coin of the U. S. may be used with advantage. But of the large array of disorders cited by Prof. Richardson as the sequence of wearing a plate of low carat value, it is sufficient to say that where "indigestion, with acid eructations; gastro-enteritis, ague, inflammatory and typhoid fevers; brain affections, eruptive diseases; rheumatism, gout, etc." exist, that the "natural sequence" of one or all of those affections would be to produce the troubles he charges to the corroded plate, viz: "inflammation of the mucous membrane and gums, with chronic periodontitis and loosening of the teeth; apthous ulcers; gastric irritations, general nervous disorders; decay of the teeth, fœtid breath; disagreeable metallic taste in the mouth, etc." It would be almost as fair to charge the plate with the gastro-enteritis, ague, gout, etc., as with the local diseases which are the common sequelæ of such grave diseases, and which are thus given such obviously wrong etiology. It is such blunders as these that have brought upon dentistry the stigma which the medical profession attach to us, of would-be scientists, and if this is taken as a sample, justly.

On the subject of clasps, no mention is made of the alloy of platinum and iridium, which is far superior to the alloy of gold and platinum for this purpose. And indeed this alloy, so useful for various operations in dentistry, in the shape of wire for pivoting, etc., as to be well nigh indispensable to the writer, is not mentioned in the chapter on alloys as at all useful. Moreover, Prof. Richardson seems to be oblivious of the fact, as he does not mention it, that the alloy of gold and platinum is so readily tarnished as to be quite objectionable on that account; much more readily than the alloy of gold and copper.

It is well to mention, what is omitted in this work, that there are two guage plates of different size, in common use —the American, and Stubb's. A lack of this knowledge may lead to confusion; and also that small quantities of solder may be quickly and readily made on a piece of charcoal, this latter substance greatly preventing the oxydation of any oxydizable metals present. A simple method of obtaining pure copper for alloying purposes would be valuable also, in this place.

On the subject of the removal of roots of teeth, as preparatory to the insertion of an artificial denture, it is said by Prof. Richardson, that the roots of teeth, if allowed to remain, offer "so many fixed points of resistance," and the mucous membrane yielding, allows the piece to rest or press unduly on the former. But, unless there be only a few roots, these, if healthy, should bear the pressure of the plate as well as the teeth formerly supported by them, and of which they were parts, sustained the pressure of mastication. The truth being that, on account of the inevitable change in the upper lip and its muscles, due to absorption of the alveolus, *and which no artificial appliance can fully* *restore*, it is highly important to leave, whenever it can be done, the roots of the six anterior superior teeth in position, provided these can be restored to health, if diseased. Of course in all cases they should be so filled as to prevent the recurrence of decay. An artificial appliance can be made of perfectly satisfactory character for the mouth of any such patient; and it is the duty of the dentist to know how to do this, and not extract these roots, to simplify his work.

It is an unphilosophic and incomplete book which passes over the subject of the changes which occur in the jaws after removal of the teeth, in the manner of the one under review. No attempt is made to explain the rationale of the process of absortion; no mention made of the changes in facial conformation, displacement of muscles, etc; and nothing is said of how important a factor pressure is in hastening, modifying, and, possibly retarding absorbtion. It seems singular that so obviously an important branch of this subject should have escaped the attention of the author.

The chapter on wax impressions is faulty in its lack of detail, and especially in that it should have given importance to thoroughly cooling the wax before attempted removal from contact with the ridge; and no teaching on this subject is complete which neglects the cardinal principle that *a thin layer of impression material* is essential to correctness in copying. No mention is made of the chemical constitution of plaster, or of the fact that it is necessary to calcine it before using it, and neglect is made to state that where the setting of plaster is hastened by the use of salt, that such a cast is worthless except for almost immediate use. The use of potassic sulphate, so superior to sodium chloride for hastening the setting, in that it does not injure the plaster, is not mentioned. One would judge from the remarks of the writer, that he was unacquainted with the value of plaster as an impression material in partial cases, but this part of the subject is mixed up so with various methods quoted that it is difficult to judge how much weight Prof. Richardson attaches to his own views. No mention is made, or description given of Bean's admirable method of swaging a cup and coating with shellac and cotton, for plaster impressions. In difficult cases it is by far the most accurate method known to the writer of attaining a perfect impression. No one who has once used a small curved spatula for dilating the mouth, while introducing the cup, will ever dispense with this useful appliance. This Prof. Richardson does not seem to know of, or does not mention its use. Prof. Austen's admirable invention of an improvised gutta percha cup, is not mentioned at all. In reference to gutta percha, its property of contracting is referred to as rendering it necessary to fill up the impression immediately with the plaster cast. But as most, if not all of this cooling and contraction would occur before the' cast solidified, it would seem that this process was unphilosophic. Prof. Richardson expresses the opinion in his book that it is impossible to get a correct impression in wax for a full denture, and we gather from the tone of the book that he likewise deems it difficult, if not impossible, to take partial impressions with plaster. Most dentists will be apt to reverse these opinions. No recognition is given of the importance of filling the impression, especially if it be of a partial case, with water to facilitate getting the plaster into the cavities in the same; or of tapping the cup to settle the soft plaster.

On the subject of pivoting teeth Prof. Richardson remarks, in speaking of cases where constitutional tendencies to inflammation exist, that "the operation, if done at all, should be done in the most careful manner." We respectfully suggest that any operation, under any circumstances, should be performed in the most careful manner, and he who in any case neglects this, is gravely at fault.

In preparing the root, the use of drills is accompanied with the absolute injunction that "they should be kept wet," while the almost universal practice at present is to use drills and burs with the cavity dry, and the rubber dam adjusted. No mention is made of Gates' drill, so invaluable in reaming out the canal. The chapter on pivoting is quite long and compiled largely from recent sources of information, though much of it is dental surgery proper, as much so as filling teeth. Bonwill's latest methods for pivoting are given in detail, methods not really so good as his earlier devised platinum pin and nut.

In regard to those front root amalgam fillings, we have found that in all cases, noticed so far, a disagreeable blue hue is given to the gum by the discoloration of the root by the amalgam.

The chapter on swaging is faulty, in not being sufficiently explicit and full. Thus the use of a jeweller's saw for cutting the plate to shape is not mentioned, and there seems to be no knowledge of the fact that plates, either partial or full, should be stamped nearly to shape before trimming; and what is even worse, no mention is made of the dangers that attend annealing a plate which has been swaged between lead and zinc, without preliminary careful cleaning in acid to rid the gold of any possible contamination. No means seems be to known to Prof. Richardson whereby pleating or folding of a plate may be prevented: and, helpless in the presence of this easily prevented accident, advice is given to cut out the fold and solder the joint. No mechanician who took a pride in his work, and who thoroughly understood swaging would tolerate such a procedure. Doubling the plate is mentioned, but the method not described. The obsolete method of cylinders with wood contained, to press against teeth, for retaining partial pieces; as well as the pivoting of a plate with several teeth to roots, are both retained, as though still in use. Neither the philosophical principles underlying the use, or the common abuse of vacuum cavities are mentioned at all, nor the injurious effects of the deep cavity alluded to; while the important subject of securing a correct articulation in partial cases, is dismissed with the observation that the plate, with a rim of soft wax on it, is to be placed in the mouth, and the patient instructed to close the jaws naturally. No mention is made of the desirableness, in cases where there are three or more points of articulation, of taking an impression of the lower teeth, procuring a cast, and using the upper and lower casts thus obtained to determine the bite; a much more exact, convenient and elegant method than any other. In taking bites in full cases, Prof. Richardson gives only the impracticable method, by which no one ever controlled the erratic movements of the lower jaw, of pressing it backward with the hand. True, some pages further on, the remark of Dr. Bonwill is quoted that the act of swallowing will prevent protrusion of the jaw, but this is not grouped with the directions in proper place. It may be said that these are captious objections. and that it is a small matter. The whole of dentistry is made up of small matters. Over five pages is given to the description of the "anatomical articulator" of Dr. Bonwill, of which we have only to say that as Dr. Bonwill states, and truly, that "if the bite in wax is not correct, *no articulator can make it so;* you must go back to the mouth and retake it,"—the common backward extension of the model in plaster will serve the purposes of articulating as perfectly and more conveniently than anything else. In grinding porcelain teeth, no instructions are given to trim the plaster cast when plain teeth rest directly on the natural gums, (in metal plate work) to secure neatness of adaptation to the gum; and nothing is said of corundum wheels, as to the care that should be taken of them, methods of dissolving of the gum upon the surface where the wheel may cut badly from heating; and no instructions as to how to mount wheels. In fact *only three lines* is given to this subject. The subject of "carved block teeth" occupies nineteen pages. It may be well to keep this in a "book up with the times," but it is hardly probable that many will study this almost lost art, or art superseded by special manufacturers. We suggest that a carefully prepared compendious description of the continuous gum process would be better than the rather diffuse statements of five several writers. On the subject of vulcanite, Prof. Richardson risks the perdiction that the abandonment of this substance "as a base for artificial dentures by intelligent and conscientious practitioners is an event of the near future," and he thinks this "would be in the interests not only of the profession. but of all concerned." Many imperfections and omissions might be noticed in the chapter on vulcanite, but we have no time to notice these, and this chapter is one of the best in the book. We remark as noticeable the absence of any method of repairing vulcanite plates, of the use of a solution of vulcanizable gum in benzine or other solvent as a cement between the new and old portions of the plate. He will find few, however, to agree with him in his statement that the "chief objection to celluloid is its low power of transmitting caloric." A full chapter is given to Dr. Reese's gold alloy cast late, while no mention is made of the old and well received stanno-plastic methods of Wood and Weston. That these are useful is beyond question, and time has tested them, which cannot be said of the method of Reese. This latter, however, would answer well for the alloys above mentioned.

Dr. Kingsley has a chapter on the treatment of defects of the palate, in which the soft rubber velum is insisted upon. But if we remember rightly, Dr. Kingsley has lately stated that a hard rubber velum is as efficient; while Dr. T. B. Gunning, no mean authority, states that the hard rubber is the *only* efficient velum, fulfilling all the requirements of any case.

We have no desire to make a captious or fault-finding criticism of this or any book. It has many excellencies; but its defects are too obvious to escape the eyes of the teacher or trained reader. We have hinted at the cause of some of these defects, and feel them to be due to a lack of practical knowledge on the part of the compiler. We use this word compiler designedly, not knowing Prof. Richardson. It is apparent that the book is mainly a gathering together from the literature of the past years of dentistry, such material as seemed popular, without thorough individual testing of any of it, as to merit or usefulness. We feel sure that had the writer set himself as earnestly to work as did Prof. Austin to sift for himself every statement, analyze each alleged fact, and bring to the test of practical experience every step in his work, the book before us would have been free from many of the flaws we have pointed out. It is a striking commentary on the paucity and meagerness of dental literature that the one book written solely on Dental Mechanism, (the little publication of Mr. Coales, of England, does not deserve the name of a book,) should be so full of error and omission. It is to be hoped that this department of our profession will be written up. It deserves it.

ARTICLE III.

A Dentalation as Recently Delivered before the Odontological Society of New York.

BY J. WASHINGTON CLOWES.

My subject, this evening, is "MATERIALS FOR FILLING TEETH." There are several of these worthy of special mention: Gutta Percha, Gold, Os-artificial, Tin and

Amalgam; each very good in its appropriate place. In the olden time Gold was considered the only proper filling for the fangs of teeth, and, under this impression, many heroic attempts were made, some resulting in success, others in failure; but in the main, it was a worthy procedure, because the motive and the material were pure. In process of time, another substance was employed, which obtained consideration by reason of the great confidence reposed in the person who advised its use; but it has been proved a deception and a fraud, and its name is cotton! A fang thus filled will sooner or later come back to plague you, or your patient will be driven for relief into other hands. Cotton was retrograde, Gutta Percha is progress, and under the name of "Bevin's Stopping," is the most perfect fang filling in the world.

Gold! Ah, my friends, there is magic in the word. Gold! pure, unadulterated gold is accepted the world over as a standard filling; but it has its place. It is only second-rate for fangs. It often fails in large and shelly rearmost molars, and is not reliable in approximal cavities of difficult access. It is gold? It is precious gold! But we must not fall down and worship it!

Tin and Os-artificial have many commendable qualities, and while I acknowledge their merits, I cannot refrain from saying, they are at their best only, when covered by some material harder and more durable than themselves.

Amalgam! What shall I say? As I mention its name a throng of memories crowd upon my mind! I recollect its early associations, its imperfect material and preparation, and its mal-appliance. I recall the long list of evil names that have been given, and noxious qualities that have been ascribed to it; that it was once the cause of a fierce dissension in our professional ranks; that this dissension culminated in revolt; that the elemental and component parts of a great and learned association were dissevered, broken up and scattered; that the combatants, for and against Amalgam, fought exhaustively and long, and that (the great battles being over) a guerilla warfare still continues, on the part of the vanquished, from behind the cover of famous names, groundless prejudices, shameless calumny and popular alarm. Thirty-one years ago, Amalgam, as a filling for teeth, was brought to my notice. It was spoken of by Doctor Harris, of Baltimore, in most uncomplimentary language. By him the initial class of the first Dental College in the world, were taught that it was poisonous; they were admonished to abjure and refrain from it in their practice, and as they were taught so went they forth, to their various fields of labor, denouncing its users and condemning its use. In my office, during the first years of professional practice, poison, salivation, galvanic action, charlatan, quack, humbug, impostor, were words of frequent utterance, and the mere sight of an amalgam plug, in a patient's mouth, would excite my indignation, and arouse within me the spirit of antagonism and warning. It was on an occasion like this, at the close of a wordy crusade against the forbidden filling (my last javelin thrown and ammunition exhausted,) that my patient thus replied: "I have heard attentively all that you have said, and am disposed to leave the matter in your hands, but first desire to give you the history of this particular filling, and then will submit the case entirely to your judgment. Three years ago I called upon Dr. D——— in reference to the tooth that holds this plug, and asked his professional advice. After a long examination it was decided to be past saving, the nerve bare, the tooth itself a mere shell, and extraction the only proper and rational thing be done. I said: 'Oh, doctor, how can I part with my tooth? What shall I do without it? Do, doctor, think of some way to save it!' He replied: 'There is no way; I can do nothing,' and proceeded with his lance to sever the gum; this being done, I made a last appeal—with bleeding mouth, I entreated him to do something—anything, but allow me to lose my tooth. 'My dear lady,' he said, at length; 'there is one thing I can do, if you wish it. I do not approve of the means to be employed; but it may possibly help to keep your tooth for awhile; I promise you no real benefit from its use. It is called Amalgam, and is everywhere spoken against, and no dentist who is careful of his reputation would willingly use it. Shall I employ it?' 'Anything, anything,' was my answer, 'rather than part with my tooth.' He proceeded to remove merely the loose particles of food and decay from the cavity, and after preparing his filling in the same imperfect manner, applied it with the pressure of his finger. Except for about one week, subsequent to the operation, during which it was sensitive to heat and cold, it has been to me for the last three years a comfortable and useful tooth. Is it *really* poisonous, doctor? Will it really salivate me? Will it affect my health injuriously? Must you remove the filling that has proved to me so good a friend?" There are crises in our every life. They come to us by benign appointment. They are golden opportunities presented by invisible hands. We may recognize or ignore them, we may accept or reject them. But our decision must be prompt; they do not tarry. We must seize, we must lay hold upon them, when they appear, or they pass us by forever!

When my patient had closed her narration I felt there was a *crisis upon me:* the hand of progress had rolled back the veil of prejudice and error, and presented to my mental view possibilities and opportunities eminent and glorious! The pathway of usefulness was before me. It was mine to pursue it, and I did. The Amalgam plug, that had been imperfectly prepared and inserted, was removed, but only to be replaced by one improved by care and precision; for I reasoned, "if good has been accomplished by the incomplete and unskillful, what may not be achieved by better means and methods?" Many years after its refilling, the tooth, from which I had removed the imperfect plug, was still doing faithful service in the mouth of her who had appreciated and deserved it.

I dwell upon this case with peculiar emphasis; because it was the opening door through which I passed to a higher plane and clearer view. For more than a quarter of a century I have stood upon this plane, and with all the energy I possessed, have openly and fearlessly proclaimed the excellence of Amalgam. From the first moment of my full conviction of its worth, I have not failed in its advocacy. Amalgam was always a saving plug, and, in the march of dental progress, there is none that gives fairer promise of ultimate perfection.

The assertion of Dr. C. C. Allen was well and truthfully made, when he declared: "If my life and fortune depended upon the saving of a tooth merely, without regard to its appearance, I would fill it with Amalgam."

If such was the testimony of one of the fathers, in reference to this filling, in its beginning, what may not be said of it now in its advanced and improved condition? As I first saw it in the mouth, it presented a dark and uncomely appearance, which was invariably imparted to the substance of the tooth. It was black, but it was honest and true. If its ugliness was a reason for rejection, who then shall be received? As a preference for the beautiful, as well as the good, is commendable and wise, I resolved to strive for their attainment. My first step in this direction was in the employment of pure materials. The original coin filings, having an admixture of copper, were replaced by a precipitate of virgin silver; giving the result of a whiter, but more fragile filling. The next evidence of progress was the addition of a certain proportion of pure tin-foil to the precipitate. This lent toughness to the mass which, when applied imparted no discoloration to the dental walls, but was still subject to blackness on its face. To me this was matter for deep regret, and in those days—when my patients would cry out against the "darkness visible"—I never failed to remind them that they must not "speak ill of the bridge that carried them safe over," and as to the color it was only superficial,—a mere stain, that an appropriate dentifrice would readily remove. But I longed earnestly for the "good time coming," when no uncanny look should appear upon the surface of my work. That time has come. To Drs. Hunter and Lawrence its advent is mainly due, and to the latter especial praise belongs; his Amalgam, when skillfully applied, is one of the best fillings for the teeth of which I have any knowledge. May he live long, and strive continually to improve it even to perfection. Thus imperfectly have I discussed the merits, development and progress of Amalgam.

Conceived in weakness, brought forth and nurtured by empyricism, traduced, maligned, denounced by professionals in high places, malused, abused and buffeted, it has come to be a power in the land. Out of weakness it has grown strong, and the very vices of its origin, are covered by the mantle of its virtues! Its most potent enemies have been *misuse* and *disuse*. By the one, apparently abundant evidence has been given for its condemnation; by the other, under cover of regard for the public weal, the attempt has been, and is, constantly made to bring it into disrepute. What shall I say of him who has villainously forced a metallic substance upon the exposed dental pulp? How can I sufficiently execrate the wretch who crowds any filling into the fetid internal of a dead and ulcerated tooth? From acts like these come irritations, inflammations, swellings, suppurations, nervous prostrations, and a host of other ills, the cause of which is apparent to *disuse* only when Amalgam has been employed; but to the intelligent and candid mind is proved, as well as appear, to be the result of pressure and obstruction from any foreign source. Thus, contact and association, with dying and deceased dental pulps, have covered Amalgam with especial obloquy, and, like poor, peaceful dog Tray, it has suffered accordingly. Disuse, in the past, assumed its most formidable proportions, its very culmination of antagonism, in the person and assertions of one of the elder dentists. By what peculiar means, by what subtle influence, he was enabled to catch, absorb and control the public mind, I leave unsaid; but as an alarmist, I may assert, that seldom has one appeared among men more persistent and terrible; like him of ol who sat at the feet of Gamaliel, he persecuted with zeal and its results have indeed been wide spread and appalling When the startling cry of "fire! fire!" is shouted in th midst of multitudes that seek for safety in the mad rus toward a single and narrow exit; the trampling of th strong upon the weak, the shriek of agony, the smothere groan, the crackling flames, the blinding smoke, are scene and sounds that mark the passing tragedy. All these shal have an end: but the alarm which goes abroad—that enter many peaceful homes, and with a ceaseless torture, distract the mind and generates distrust—this is a living woe, a limitless calamity! As by one man's *ipse dixit*, this evi influence was set in motion so by many others of like temperament and equal capacity, it has been nourished and sustained. No words can tell, no pen portray the amount of mischief which the Great Alarmist and his pliant disciples have ignorantly wrought.

As when, beneath the Banyan's outstretched arms,
And sheltering shade, the tribes of men abide,
(Harboring no thought except of confidence.
Feeling no impulse save of gratitude,)
Content and peaceful thus, day after day,
In happy sequence, glides, and all is well!
Anon a rumor comes, borne on the air,
A startling rumor! At first so startling,
As scarce to receive the slightest credence,
Yet makes no pause; but most assiduous,
Still comes and goes until, at length its voice,
Insinuous with subtle guile, absorbs
The conscious sense and tensely list'ning ear!
Then consternation, vast and terrible,
Assumes control, and holds high carnival!
The well beloved and sheltering Banyan arms,
The far o'er-reaching shade—the home content,
The social joys—unnoticed press, unheeded call,
And forth from their embrace and kindly cheer,
The frighted habitants bewildered run;
For rumor infamous, and vile, and base,
With still envenomed words and slanderous tongue,
The good old tree, a deadly Upas calls,
And is believed.

The combination of metals known as Amalgam, is singular in this: That of all the faults it is said to possess, of all the harm it is said to have done, it is as free and innocent as the child unborn. It never did and it never can poison, salivate, galvanize, or injure any one in the least degree. As innoxious and digestible as a grape seed to swallow; it is as incapable of evil as the hand of friendship or the kiss of affection. I am impelled to take up its defense at this time by a sense of duty which I owe to it and to every people, wherever in the wide world the voice of its calumniators has been heard, believed, and had power to alarm. I know of no worthier act than the performance of duty, no higher aspiration than the enunciation of truth, no attainment more eminent than professional excellence. By the sense of duty well performed, by the truth fearlessly proclaimed, by the excellent idealized and labored for, I beseech you, brethren, be not henceforth faithless but believing.

What shall I say? Amalgam! How wonderful and mysterious the union it represents! How beautiful the chemical affinities that bind it! Was there ever before such a metallic blending as this? Pliant to manipulate, facile to apply; to weakness lending strength, to frailty support. Plastic in form—now moulded by the touch—yielding to slight pressure, penetrating and filling the minute, as well as the vast; entering into and hermetically barring the interior of a tooth against the attacks of its enemies. As we contemplate, we admire; while admiring, new wonders rise! The soft and ductile becomes hard and unyielding; the impressible a fixed and unchanging mass; inexpansive and unshrinking, how perfectly it does its work! If it lacked either of these qualities it would fail in its purpose. It does not lack, it does not fail; but in all the essentials that make up a saving plug it eminently abounds. There are general providences all around us; there are special ones as well. In the far-gone ages the great and good Father laid up in store for his children the materials from which coal has been formed; He knew what would be their wants, and provided for them. Without this provision how deplorable would be our condition! No tree would gladden us with its leafy verdure or refresh us by its shade. The mountains would not be crowned with waving forests, or the hills with beauty. Our necessities would have required their sacrifice, and the earth would be desolate. Amalgam is a special providence. It has come in the order of Divine beneficence to supply an imperative need. Mastication is essential to the health and continuance of our race, and without Amalgam myriads of human teeth, that are now accomplishing their appropriate work, would have utterly perished. If in the warmth and light that emanate from the black product of the mine, we recognize the providing hand, why shall we not also behold it in the means that enable us to perform the functions essential to nourishment and life? Amalgam, like the Rubber Dam is one of the best aids to the highest professional achievement. Like the dental file, it has no faults in itself, and wherever skillfully used works out its own praise, and its capacity for usefulness is truly marvelous.

ARTICLE IV.

Pathology and Therapeutics—from a Conservative "New Departure" Standpoint.

BY F. E. HOWARD, M. D. S., GENESEO, N. Y.

(Read before the 7th and 8th District Dental Societies, October 26, 1880, at Rochester, N. Y.)

Pathology, respecting secondary decay, is viewed very differently by many at the present day, from what it was five years ago. Up to about 1875, it was generally supposed that secondary decay about fillings arose from "exactly" the same causes that the original disease was produced, and is identically the same thing,—"via" "decomposition of tooth structure, the result of solvent action of acids, which have been generated by fermentation going on in the mouth;" or the "chemical union of mineral constitutents of the tooth, with elements contained in the fluids to which it is exposed;" the result of wanton carelessness, or inability on the part of the patient to maintain absolute cleanness about fillings.

When secondary decay did occur about gold fillings, and it could not be charged to the results just mentioned, it was attributed to "defective manipulation." Operations were repeated from time to time, and repairs made with the same results, by "this faction" of the profession.

Another class of the profession were not satisfied with this explanation of the cause of secondary decay about fillings, and proceeded to investigate the subject, from a *scientific standpoint.* The result of such investigation has led to the development of new theories, termed the "new departure." They maintain that secondary decay about fillings may be, in many cases, the result of incompatibility between filling and tooth bone. The result of conductivity of fillings. And that the successful treatment of many cases require a physiological change in the organ, or therapeutic and antiseptic treatment, not "recognized" prior to these investigations. They claim that at certain stages of decay, a metallic filling (we will take "gold," as this is the best conductor,) promotes decay, and in many cases it is the *prime agent in provoking it.* This is the view we are compelled to accept, from a careful, practical observation, in every day practice.

When this is manifest, it is shown in that class of poorly calcified teeth, and in those of young subjects, where the "aqueous" or vital element is in excess of the mineral constituent. If these teeth are filled with gutta-percha or any non-conducting material, though the fillings may soon be worn away by attrition, the decay is absolutely stopped so long as the material remains in a position to protect the walls of the cavity from external causes of decay; such as preventing the ingress of particles of food, and foreign substances in general, even though "dampness" pervade the whole *cavity underneath the filling.* And there are few cases where gutta-percha fillings are water tight. In this class of fillings though often imperfectly done, decay in the very poorest quality of teeth is effectually arrested.

Why so? "Because the aqueous element of the tooth, being of the same nature as the solid constituent, has no power to act upon the latter, and cannot cause decay, or dissolution, until the equilibruim is disturbed." "Decay only takes place, when the external fluid is rendered chemically different by confinement in fissures, pits, or cavities, and is thus changed from the other fluids, to which other surfaces of the teeth are exposed." The non-conducting filling being in harmony with the tooth, the aqueous element remains neutral or becomes neutral by contact with this vital fluid. This is the case with leaky non-conducting fillings, consequently there is nothing to excite chemical action. The decay is arrested by external excitants being shut out, such as thermal changes, electrical currents, and decomposing fluids, and nature goes on unmolested in the work of more perfect calcification of the organ.

This, together with the usual antiseptic and disinfectant remedies, is the topical, therapeutic treatment that such cases require. And yet, this is not the course that is best to pursue in all cases. It is often advisable to use a material that is antagonistic and incompatible with the tooth structure. Under these circumstances we must anticipate future decay, and make calculations accordingly with the idea of refilling, or repairing, at no distant future. Because if we fill these poor, soft, or imperfectly calcified teeth with gold, we must depend upon it, the aqueous element, natural to this class of teeth, is in a condition that is liable under many circumstances to work mischief, despite all efforts on our part, not excepting those of even a few of the best operators we have.

In this we mean to show that we have an element to contend with, that mere mechanical means will not overcome. Gold is not a "panacea" for all conditions of decay of the teeth, any more than some "patent medicines" are for all ills that flesh is heir to. For an example, we will take gold, and fill this class of teeth in such localities as proximate, and labial surfaces, and the filling will often exert a deleterious condition. There is a certain class of teeth that we have to operate on, that we find affected by decay—sometimes it might be termed erosion more properly—where the lime salts are dissolved out at a line ascribed by the gum, white opaque patches are presented that can often be removed with the thumb nail, being so soft, and chalky, caused by the dissolution of earthy matter occasioned by acid secretions. Now we must admit, that if we prepare a cavity of this sort, and fill with gold, the margins about the fillings seem to fairly melt away, like snow beneath the noon-day's sun. This is not always the result of imperfect manipulation; if these fillings are absolutely water tight in themselves, the result may be the same. Often there is so much of the aqueous element in the organ, that it is impossible to dispose of moisture about the fillings for any great length of time, no matter how skillfully the operation may have been performed. For in this class of teeth there seems to be, under some circumstances, a *retrograde action*, that "supercedes" the topical therapeutic treatment, that may have been applied to the cavity before filling.

And this is one thing that the opponents of this theory have lost sight of, or would not look at squarely in the face, but hang their faith on this peg; that if there is no leakage about a gold filling there can be no electrical action; and if our fillings are water-tight, so as to perfectly exclude external moisture, we have accomplished all that is necessary for success. A few have recognized this in a measure, but claim where this aqueous condition is manifest, it is confined to the dentinal tubuli, and not so with the enamel—the latter being of such a dense structure is devoid of this aqueous element entirely. And that if a filling at the margins be perfectly water-tight, the moisture from the dentinal tubuli will be inert to act deleteriously upon th tooth—for no electric current can be established.

But this is an error, and not the case at all. For it ha been shown conclusively by Dr. Abbott, (and I thin others,) that "the enamel is not *a crystal but a living tissue* endowed with the same vital element as dentine, only to less degree." Now that this is an established fact, it is ou conviction that a filling often becomes a battery, in man cases, where the operation is "absolutely perfect." An the result is electro-chemical decomposition about the margins of fillings, in spite of our best efforts.

Doubtless many of you have seen discoloration abou fillings made with "crystal gold" some years ago, of bluish character, that is generally pronounced "leakage. In fact this gold was discarded by many, because of th discoloration that often followed its use. In many case this was not the result of faulty operations. I have see many of these fillings, inserted by eastern gentlemen o acknowledged ability, whose operations with gold are perfection. About many of these fillings there was a "blueness" which was proof positive of chemical action. Th acid used in the preparation of this gold, had left its mark The iron had entered the tubuli, and the aqueous elemen in the tooth was fuel sufficient to feed this chemical fire In such conditions, with soft teeth time generally pronounces the verdict of failure. With well calcified ones the power of resistance to such impressions may prove success.

When we think of the recognized make up of the differen classes of teeth and hear the claim made, that gold is th best filling for all teeth, or as good as any, if properl manipulated, it reminds me of something that has bee said by Dr. S. B. Palmer on this subject, and it goes t show how absurd it would be to apply this principle of gol in all cases, to other matters outside of the mouth, wher judgment should govern our operations. He says: "I case of repairing a leaky cistern, wisdom would deman knowledge of the material of which the cistern is composed, and the nature of the repair necessary. Then call a carpenter, plumber, or mason to make the repair. A porous cement cistern would not be benefited by the carpenter or plumber, only by a mason, and the application of a chemical to fill the pores over the entire surface." * * *

And in this class of teeth mere mechanical manipulation of a material that is indestructible in itself, cannot be made subservient to meet the requirements of all cases.

Dr. Flagg uses no gold in his own practice at the present day. Yet this is not the teaching of the new theory. He says, "that the 'New Departure' concedes the use of gold as a filling material whenever! and wherever!! it can be used for the preservation of teeth as successfully as other materials. The new departure begins where gold leaves off, to help gold if need be, to sustain its exalted reputation, and to furnish a substitute in other materials, in cases where gold is inadmissible."

And he remarked at the outset in presenting his paper to the Odontological Society, New York, in 1877, which excited so much discussion and comment: "I do not wan to say anything to you of the teeth which you are in the habit of filling successfully, and as we express it, satisfactory with gold—teeth of dense structure, whose cavities have walls so strong that you can impact a filling which lasts a life-time. But I do ask, that you will gradually discontinue this packing of gold into teeth that are so poor, so frail, so unsubstantial, that it is, to say the least, doubtful whether the result will be creditable to your profession, or satisfactory to your patient."

This is the point I wish to make. And it must be admitted by any intelligent, unbiased dentist, that many of the non-conducting fillings that we have at our command, meet the requirements of such teeth better though the filling may be short-lived in itself. But it is really the topical therapeutic treatment, that such cases often demand

Who is there, that has practiced for some years, that has not groups of gold fillings on labial surfaces, one adjoining another, put in at different times; or removed and renewed the whole operation, from time to time? We do not denounce the practice; often we are compelled to choose the least of two evils. If the subject cannot have the case renewed from time to time, when the plastics are used up, (for in such localities, gutta-percha, oxychlorides, and the like, are soon worn down by friction and attrition. I trust we have something better in the "Oxy-phosphate." The latter I have experimented with for two (2) years very satisfactorily. But this is scarcely time enough to determine its durability, and in what class of mouths, and what condition of the secretion, they will do the best service. And when this class of plastic fillings are not admissible in our judgment, according to the varied circumstances that may be presented,) we must do the next best thing, which would be to devote much more time in the operation, and increase the expense of a gold filling, often at the expense of the vital organization of the tooth, instead of having that soothing antiseptic and therapeutic condition imparted to the organ, by the non-conducting fillings. The latter assists nature in the work of perfect development; while the former "somtimes" retards this progress, for under chemical excitement, she cannot perform this office.

I recognize gold as superior to all other material in general that we have at our command, if skillfully manipulated. But it must be used with judgment, in its proper place. We must acknowledge its conductivity, consequently its inadaptability to meet the requirements of all cases.

The therapeutic effects of English precipitated chalk and lime water, would do much to stay the progress of decay in this class of teeth, by counteracting the acid condition of the secretion usually manifested in such cases. A hygienic diet with young subjects, would work a great change. But what can we effect in respect to hygiene? But little. People will eat what their appetites crave, if t is at the expense of teeth. The good advice that we may be inclined to give on this subject, will not be heeded by many. The topical treatment, conducted by the dentist, is about all that will effect much, aside from the beneficial results of ordinary cleaning. This, most all will do.

We must depend upon our own exertions; success is only accomplished by good judgment on our part, and a thorough knowledge of the requirements that each case demands.

The application of such remedies as carbolic acid, creasote, theymal, oxide of tin, and varnish, will effect much toward making perfect operations in gold a success. By the affinity of the tooth element, for remedies applied, the tubuli is sealed up in a measure and the aqueous element disposed of in a degree. Our object should be to prevent chemical action, by the application of such remedies as tend very much to dispose of the aqueous element. If this is accomplished, and gold operations are absolutely first-class, our efforts are generally crowned with success. If we do not succeed in controlling chemical action, non-conducting fillings will usually best meet the requirements. This precaution would often make a successful operation in gold that would otherwise prove a failure. In fact, the application of carbolic acid, or creasote, should never be omitted. For it disinfects the cavity, thereby acts as an antiseptic, obtends sensitiveness, lessens thermal shocks, and imparts general comfort and satisfaction to the patient.

When cavities are deep, it is usually best to line such with some non-conducting material, as a decided benefit will be derived from such a practice. It is plainly shown that a tooth affected with caries does not remain passive and inert to impressions of decay; but, on the contrary, great efforts are made by nature to protect pulps from exposure, and from carious influences. And the half decomposed calcarious condition of caries in cavities, or superficiallp located, is often transformed into a hard and bony-like consistency. A condition that further decay makes but slow progress in. Now this is the natural work of nature; it may be assisted, or retarded. Irritation wi produce either.

A gutta-percha filling will be neutral, and allow natu to go on with her work uninterrupted in calcification the fibrili.

An oxy-chloride filling will stimulate the pulp to a active condition, if rightly applied. If too strong, th hydro-chloride, an element that the material possesses, ma inflame the pulp, and death of the organ may ensue.

An oxidized tin filling prevents galvanic action, a antiseptic condition is established, leaving the walls of th cavity in the most favorable state to resist decay.

Dr. S. B. Palmer tells us how amalgam fillings preserv the teeth. He says, "Amalgam at first acts in the sam manner as gold—though in a less degree, because it is no so good a conductor. But later the poor amalgam become itself oxidized, and the current is then lessened. Also th metallic coloring matter thrown off by oxidation, is receive into the softened bone, until the once positive elemen becomes neutral."

Thus decay is held in check. A gold filling does no oxidize, and can not hold decay in check, like tin an amalgam, and as often manipulated and inserted, irritat the vital condition so that decomposition and disintegratio is promoted. How so? The gold filling becomes, und some circumstances, an agent of circulation. It promot chemical action, it excites or increases this by establishi a galvanic current, which acidifies saliva, and then aids i producing an agent like acid, which irritates the vit organization of the tooth, causing it to break down at th margin of the filling. Then we have a condition estal lished, that we term electro-chemical decomposition. Th same condition of things in "well calcified teeth" woul not be likely to make any impression upon the organ i this direction.

Thus it is, that a gold filling, in certain locations, and i well calcified teeth, may last forty (40) years; where one equally good, or better, in another class of teeth, might not last forty weeks.

The "new departure trio," Drs. Palmer, Flagg and Chase, have developed these principles. They have been recognized as existing by many, for years. They have demonstrated plainly to my mind, the cause and effect of this theory. In practical observation I have seen its working. It has better fitted me to accept the situation, and prepared me to battle with the enemy. It has shown me the remedy for this and that case. It has given me instructions how to master the elements of decay, upon scientific principles, instead of merely mechanical means.

These men are benefactors. They have put at the disposal of the profession those principles with which to hold in check this destructive element. It is not going to revolutionize operative dentistry, by causing men to discard gold, and stuff cavities with plastics. The "new departure" does not advise anything of the kind. It should not be assailed on the ground that it is degrading, and will lower the standard of dentistry. Gentlemen, it is the reverse. The proposition of my esteemed friend, Dr. Flagg, is: That you enlarge the field of usefulness and the work of conservation of the teeth.

He says: "Make a beginning with the tooth that you would ordinarily extract, and treat them. Make 'that' dentistry. Fill these with plastic fillings. It is from a desire that the forceps be laid aside that this advice is given." (Mark it.) "It is from a desire that our patients shall eat upon teeth, the roots of which are in their jaw. It is from a desire that they shall be exempt from the infliction of artificial work. It is from a desire to extend the blessings which the hand of our profession holds to bestow. It is that we may be sought, rather than avoided; that we may be extolled, rather than decried; that we may be esteemed, rather than censured; that rather than be feared, we may be loved and respected."—*Dental Advertiser.*

ARTICLE V.

Caries of the Superior Maxilla.

BY TRUMAN W. BROPHY, M. D., D. D. S , CHICAGO.

On October 26th, 1879, I was called in consultation wit the family physician of the patient whose case I now report

A lady aged thirty-five, somewhat anæmic, had an abscess form about two years previously, in the canine foss of the left superior maxilla. It was lanced by her physician at a point just below the orbit and to the right of th infra-orbital foramen. It discharged freely. The wound however, refused to heal, and there was constantly discharge of sero-pus which excoriated the skin to an exten corresponding in size with a silver half-dollar. Havin treated the patient several months without improvement her physician directed her to a surgeon, under whose treatment she remained about a year. This treatment consiste of introducing a seton into the fistula, passing it downwards and carrying it through the mucous membrane, at a poin where it folds upon itself (the gingevo-labial groove. Besides this, injections of solutions of carbolic acid wer made. This treatment was kept up faithfully during th period above mentioned, without abating the disease in th least.

Indeed, the patient was gradually becoming weaker an despondent. Losing faith in her medical attendant, sh drifted, as patients frequently do, from one practitioner t another, until she had employed several. The disease ha been pronounced cancer by some physicians, who prognosticated death within two years. When she came unde the care of the gentleman with whom I saw her, she wa declining very fast. Under his treatment, however, he health improved. There existed in her case a genera catarrhal condition.

The patient had, during the progress of the disease, bee under the care of a practitioner of dentistry, who had skil fully filled the six anterior superior teeth, which were carious on the labial surfaces about the margins of the gums. The teeth were not carious to that extent, however, which would expose their pulps, or necessarily endanger their vitality. Neither was there any discoloration or other objective symptoms of devitalized pulps. The condition of the case was such as most frequently results from alveolar abscess, which cannot occur without the death of the tooth pulp. Examining the face carefully, I found that a probe passed into the fistula, came in contact with denuded bone. Believing that the inital lesion could be traced to the teeth, and not having any instruments with me with which to test their vitality, I improvised the following method, which served the purpose admirably. With a small round file heated, I ascertained by applying it to the gold fillings (had there been no fillings, I would have applied it to the teeth,) that the left canine tooth was, unlike the others, devoid of sensation: and it was at the apex of the fang of this tooth where caries of the bone was found. This enabled me to make a diagnosis of the case.

The patient accompanied me to my office, where I verified my diagnosis by drilling through the palatal surface of the non-sensitive canine tooth, when I found, as I had anticipated, the pulp canal filled with sero-pus, and by introducing the point of a syringe into the cavity in the tooth, liquid was forced through the pulp canal into the abscess and out of the fistulous opening upon the cheek. Having thus demonstrated that the diagnosis was correct, I decided at once upon the course to pursue in effecting a cure. With a bistoury, I made an incision through the mucous membrane, down upon the apex of the affected tooth, and into the cavity formed by the destruction of the bone. After controlling the hæmorrhage, by the use of a nasal speculum a clear view of the abnormal parts was secured. The alveolar process had become carious, to that extent, which exposed about one-third of the upper portion of the root of the canine tooth above mentioned. With an engine drill, I cut away the exposed portion of the root, and the carious bone surrounding it, then filled the canal with gutta percha, and smoothed it off carefully at the apex. This done, the cavity and wound were filled with boracic acid crystals. This treatment, together with general tonics, was continued, keeping up free drainage, until the cavity left by the destruction of the bone was completely filled with granulations, when the wound was permitted to heal. The fistula upon the cheek healed as soon as drainage was secured from the lowest portion of the sac. The practice, so frequently resorted to, I regret to say, of lancing alveolar abscesses externally, cannot be too vigorously condemned. Unsightly scars are thus made, all of which might be avoided by opening the abscesses within the mouth.

Three months after the operation I filled permanently, with gold, the cavity made to reach the pulp canal, which completed my services to the patient. This case was of traumatic origin. Prior to the development of the disease, the patient had received a blow, cutting the lip quite severely, on the affected side, and it was due to this accident, which severed the vessels and nerves of the pulp of the canine tooth, that its vitality was destroyed.

After the pulp became devoid of vitality, suppuration and generation of gases followed in close succession, when the pus was forced through the apical foramen, with the result above given.

The question would naturally be asked, what do you expect of a tooth after the loss of its pulp? Is it not then a foreign substance, and therefore incompatible with the economy? My answer would be, No. Certain tissues of the tooth, the enamel and dentine, have lost their source of nourishment. The cementum, however, which forms the external portion of the root, closely resembles true bone, like which it contains lacunæ and canaliculi; and is nourished by the vessels of the periosteum. Therefore, we have an organ not wholly devoid of vitality, and when properly treated, will serve for many years the purpose for which it was intended.

I have no doubt that a very large percentage of the cases of caries and necrosis of the maxillary bones, as well as trigeminal neuralgias, with all their complications, emanate from lesions of the dental organs. And it is not too much to say that if, instead of resorting to their indiscriminate removal, they were treated upon scientific principles, as other diseases are, the requirements of humanity would be far more effectually subserved.

EDITORIAL, ETC.

Extension of the Cummings' Patent.—

The following letter was written by Dr. R. Finley Hunt, in answer to an inquiry of Dr. T. B. Welch, as to what was being done by the Goodyear Dental Vulcanite Co. in the matter of applying to Congress for an extension of the Cummings patent. Up to the date of this writing no application has been made by the Rubber Company for the extension of this patent, and there is no possibility that at this late day a hearing could be obtained by them. The patent expires June 3d, prox. It is not a fact, however, as is commonly supposed, that no application can be made to a succeeding Congress, if so desired by the parties concerned. The law in this respect has been changed, and allows an application to be filed after the lapse of the patent: H.

WASHINGTON, D, C., January 3, 1881.

T. B. WELCH, M. D.—*Dear Sir:* Your esteemed favor of 29th ult. to hand. I am glad that you wrote to me, because I believe that I am better acquainted with all the points of the rubber patents, their history and the litigations about them, than any other dentist in the country. This knowledge has been gained from a persistent fight against the Cummings' patent (which I have always believed to be a fraudulent one) for *sixteen years* past. This sixteen years' fight has crippled me seriously in my finances and practice, but I have as an offset two facts to console me: 1st, That my resistance to the unjust claims of the Goodyear Dental Vulcanite Company has caused them to expend not less than $100,000. 2d, and more important, that in this sixteen years fight I have collected and am in possession of sufficient material in the shape of evidence, etc, to enable me, if properly backed and assisted by the profession, to prevent the G. D. V. Co., getting an extension of the Cummings' patent by special act of Congress or saddling us with the Haering patent. *They can do either of these if there is no organized and proper opposition.* With reference to the former, I have been watching the proceedings of Congress last session and this in order to apprise the Profession as soon as any move is made in that direction, but it *should be organized and prepared before the battle comes on.* The move by Dr. Sibley is in the right direction, but does not go far enough in this; that the petitions should be backed up by *evidence* that the patentee has been amply remunerated for his alleged invention, that the present owners have also been amply remunerated, and that the patent is not now in the hands of the alleged inventor, and such other points as may have a bearing on the case.

With reference to the Haering patent, your informant seems to have been somewhat astray. The following are the facts: Robert Haering filed in the Patent Office an application for a patent March 25, 1856, which was rejected. Oct. 14, 1868, he assigned his invention to John B. Newbrough, of New York, and obtained a patent (No. 85,927) Jan. 18, 1869, and John B. Newbrough, in a compromise agreement with the G. D. V. Co., agreed to convey and assign to said G. D. V. Co., this inventoin and patent of Haering, if they should be decided by the courts to be legal and valid. This compromise agreement bears date July 1st, 1869. The following extract from an address made by me to a meeting of dentists in Philadelphia, in 1872, will show what I thought of it then: "It (the Haering patent) is now believed to be owned by the Goodyear Dental Vulcanite Co., who, if successful now, will, in all probability, tie *it* to the Cummings' patent as they tied *that* to the Goodyear and thus perpetuate a tax upon dentists for fourteen wearisome years from this date."

You will thus see that your informant was not at all posted as to facts, and that the G. D. V. Co. is better fortified than you supposed. I think that an organized, united and *well directed* effort will be required to defeat the Co. I am willing to do all I can in any way, but I can do very little unaided. I would like to see the Profession of the country organized in each State by *Congressional Districts* for the purpose of influencing Representatives and raising funds for expenses, and the conduct of the defence of our rights placed in the hands of a well selected general committee. An inefficient defence has hitherto only added strength to the G. D. V. Co.

Yours truly,

R. FINLEY HUNT.

Protective Legislation for Dentistry is commonly misunderstood, it would seem, from the action of the Committee in the U. S. Senate, to whom was referred the bill to regulate the Practice of Dentistry in the District of Columbia. The conference had by those who were mainly instrumental in preparing the bill with the members of the Senate, shows plainly that our representatives in Congress assembled had not the slightest idea of the situation.

One Senator gravely said that if he chose to patronize a blacksmith for the operation of tooth extraction, he could not see why he should not do so, nor could he see why legislation should hinder him. His whole idea seemed to be that "tooth pulling" was the beginning and end of dentistry. And further the idea seemed to prevail that a privileged few wished legislation to enable them to monopolize a trade or business. That the masses themselves needed protection from the ignorant quacks who maltreat those whose misfortunes cause them to fall into their hands, seemed not to have entered the minds of those who were asked for protective laws. If some one could furnish this Committee of Congress with a primer of dental literature, it is possible good might be done. As it is, it is hard to see how any adequate legislation can be had. States seem to be able to grasp the idea that ours is a profession, but the Congress of the United States evidently needs illumination.

H.

The Constitution, Powers and Duties of the Board of Visitors of the Baltimore College of Dental Surgery.—

Art. I.—The Board of Visitors of the Baltimore College of Dental Surgery consists of members appointed or elected by the Faculty of the College at their discretion.

Art. II.—Resignations of Membership in the Board should be presented to the Faculty, who alone have power to fill all vacancies occurring from any cause.

Art. III.—The Officers of the Board shall appoint each year a committee of three visitors, whose special duty it shall be (they consenting) to attend the final examinations of the Graduating Class, and to advise with the Faculty as to the qualifications of the Candidates for the degree of "Doctor of Dental Surgery." It is understood that the final examinations will be held during the week preceding the Commencement week of each year, and the Faculty of the College will endeavor to complete these examinations in four days, allowing three days to intervene between the time of the announcement of the result of the examinations and Commencement day.

Art. IV.—It is the duty of the Board of Visitors, or as many of them as can do so, to attend the Commencement of the College each and every year.

Art. V.—The Board of Visitors shall determine to whom the several Collegiate Prizes shall be awarded; and said Prizes shall be awarded at the Commencement by the President of the Board of Visitors.

Art. VI.—The Officers of the Board shall be a President, a Vice President and a Secretary, who shall perform the duties usually appertaining to their respective offices.

The Officers shall be elected at a regular Annual Meeting, and shall hold their offices for one year or until their successors are elected.

Art. VII.—The regular meeting of the Board shall be held at 2 o'clock P. M. on the day immediately preceding the Commencement in each and every year.

The Board may adjourn from time to time to complete the business of the meeting.

Art. VIII.—The President may call special meetings of the Board at his own discretion, or at the request of the Faculty, or of three members of the Board. The Secretary shall give to each member of the Board due notice of all regular and special meetings.

Art. IX.—At any meeting of which due notice shall have been given, the Visitors present shall possess all power belonging to the whole Board of Visitors.

The Officers of the Board shall prepare the "Visitors' Letter" to accompany and be published in the Annual Catalogue issued by the Faculty, such letter having been first approved by the Faculty.

BIBLIOGRAPHICAL.

Webster's New Unabridged Dictionary.—

The man who said that "the place to find consolation was in the dictionary," was right, and we find, after years of work of a literary kind, more or less severe, and laboring under peculiar disadvantages in writing, that our best place to find words is in our old copy of Webster's Unabridged. It is a compendium of knowledge, so vast and universal as to be indeed nigh wonderful; and we see with surprise that the publishers, Messrs. Merriom, Springfield, Mass., are issuing a new edition, and learn further that in addition to the 118,000 words in the former, this edition has 4,600 new words, besides a biographical dictionary of 9,700 names. Any one who wishes a book, good for all time will find it here. We confess that we often turn from Appleton's and Johnson's cyclopædias and find in Webster's dictionary, what we vainly looked for in their ponderous volumes. It is truly a great work. H.

The Transactions of the American Medical Association, Volume XXXI, 1880. Containing the minutes of the Thirty-first Annual Meeting, held in New York City, June 1st, 2nd, 3d and 4th, 1880.

This Report of Proceedings contains many valuable papers on interesting subjects, and embraces eleven hundred and fifty-three pages.

Vick's Illustrated Floral Guide for 1881. Publisher, James Vick, Rochester, N. Y.

This is an elegant book of one hundred and twenty pages; one colored flower plate of petunias, &c, and 600 illustrations, with an engraved likeness of the publisher. It contains descriptions of the best flowers and vegetables, and directions for growing, and is in English or German to suit the different nationalities. Price, 10 cts., which is deducted if seeds are afterwards ordered. Mr. Vick is also the publisher of *the Flower and Vegetable Garden*, 175 pages, 6 with colored plates and 508 engravings. Price, 50 cts. in paper and $1.00 in cloth; also of *the Illustrated Monthly Magazine*, of 32 pages, and one colored plate per number. Price, $1.25 a year. Vick's seeds are considered to be among the most prolific and the best in the country.

Anatomical Atlas. Publishers, A. E. Wilde & Co., Cincinnati, Ohio.

We have received Parts V to XIV of this work, and find them fully equal to the preceding numbers. Forty-five Parts in all will be published, each Part containing four large plates, mostly life size, accompanied with ten Parts of Text of forty pages each, at the price of fifty cents per Part. Four Parts have been issued every month, and from the manner in which this Atlas is arranged, and the accuracy of the plates, it will be when completed, a most valuable work.

Horse Teeth. A treatise on their mode of development, by William H. Clark. Published by the Author, New York, 1881.

This work treats of the physiological relations, anatomy, microscopical character, pathology and veterinary operations pertaining to such structures, based on the works of well known odontologists and veterinary surgeons. A vocabulary of the medical and technical words in use is added.

Transactions of the American Dental Association, at the Twentieth Annual Session, held at Boston, commencing August 3d, 1880. Publishers: Trustees of S. S. White, 1881.

Publication Committee, Drs. Geo. H. Cushing, M. S. Dean and E. T. Darby, to whom great credit is due for the arrangement of a very interesting Report of Proceedings, which contains much valuable information.

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MONTHLY SUMMARY.

Tooth Structure Illustrated.—Mr. Geo. Fell, of Buffalo, N. Y., gave a description of a series of plates illustrating the structure of the human teeth. In explanation the speaker said these plates constituted a series of enlarged sectional drawings cut transversely, exhibiting the structure, microscopic and general, of a human molar tooth. The average size of the sectional views is about six inches square, beginning with a view of the grinding surface or top view of the crown of the tooth, and successively introducing the structure and conformation of the enamel, cementum, dentine, and pulp cavity, up to the fangs of the tooth as located in the alveolar portion of the superior maxillary bone. The exhibitor gave a very interesting description of the structure of the teeth, aided by the plates, which were marvels of ingenuity and neatness, being constructed of sheets of paper overlapping one another, colored to nature, and so constructed that the various sections could be unfolded and each successive layer of the interior structure of the tooth consecutively exhibited.

Mr. Fell stated that the drawings were prepared from a series of sections of human teeth made by himself sufficiently well to make out the structure with the microscrope. His object in preparing them was to afford the medical and dental student another aid to the study of the structure of the human tooth. For the purpose of locating the sections he had prepared a modified copy (side view) of the tooth of Dr. F. G. Lomercier, of Paris, upon which the sections were represented by a series of transverse lines.—*Proceedings of the American Society of Microscopists.*

Wax Tree.—After numerous essays made in the greenhouses of the Jardin des Plantee, Paris, they have been successful in raising numerous plants of a useful tree, hitherto almost unknown in Europe; this is the Gouing-amadon, commonly known as the wax tree of Cayenne. We have no indications of its botanical definition, whether it is one of the wax berries *Myricas*, or a wax palm. It is said to yield a wax similar to that of the bee, and equally applicable. The culture of the tree is not costly, and on arriving at maturity it is said to yield 50 to 60 lbs. of wax. It is to be tried in Algeria.—*Druggists Circular.*

India Rubber Deterioration.—India rubber is subject to two kinds of deterioration and decay. In one instance it tends to become soft, and loses its elasticity, while in the other it becomes friable, yellowish, and resinous in its nature. The last-mentioned kind of deterioration has been clearly and indubitably traced to an oxidation of the caoutchouc. This oxidation is tolerably rapid when the caoutchouc exists in a finely divided state, and when it is exposed to damp at the same time; but the alternate damping and drying of the caoutchouc tends more toward its rapid oxidation than does a continual state of dampness. The resinous matter resulting from the oxidation of caoutchouc has been carefully studied by Spiller, who found that a sample of felt, originally composed of cotton fibers and India rubber, had become so far changed during six years as to contain no trace of caoutchouc; but in its place he found a resinous substance resembling shella. The conditions under which the softening of the India rubber takes place are not so well understood, but there is some reason to believe that this is due to incipient oxidation. Ozone oxidizes caoutchouc with extreme rapidity, and the action of ozone on vulcanized India rubber is similar to its action on the unvulcanized material.—Bolas, in *Popular Science Monthly*..

Poisoning by Tincture of Arnica.—Another fatal case of poisoning by tincture of arnica is reported in the *Lancet.* A man, apparently in perfect health, drank a quantity of tincture of arnica estimated at from two ounces to two ounces and a half. He immediately complained of a sensation of burning in the stomach. Bicarbonate of soda was given, and afterwards some aromatic tincture. By these his sufferings were relieved for some hours, but the pain subsequently returned, and he died thirty-six hours after having taken the poison. This case suggested some experiments as to the irritating character of arnica. An ounce of tincture of arnica was evaporated, and yielded an extract, a little of which, spread over the skin, caused a popular eruption. A larger quantity produced vesication, just as does cantharides. The residue found in the stomach of the poisoned man, evaporated and then applied to the skin, produced effects exactly the same as those caused by the evaporated tincture.—*Druggists Gazette.*

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ARTICLE I.

Proceedings of the Maryland and District of Columbia Dental Association.—Annual Meeting.—(CONTINUED.)

SECOND DAY,
Morning Session.

The morning hours were devoted to clinics.

Afternoon Session.

The afternoon session was called to order at two o'clock by the President.

The minutes of the previous meeting were read and approved.

Dr. Winder proposed as members of the Association, Drs. L. C. Hugo, of District of Columbia; Edward Flannigain, of Maryland; M. F. Thompson, of District of Columbia, all of whom were unanimously elected.

Dr. Waters moved that a committee of six be elected from the Association to provide, at times, suitable articles for the press that will tend towards the enlightenment of the public. He suggested that all articles written for the press be first referred to the committee for their approval. The motion was carried.

A card was read from Dr. H. H. Keech, tendering hi resignation as a member of this Association. Accepted.

An advertisement of Dr. Wm. A. Mills, of Baltimore was read and charges prefered. The President appointed Drs. T. W. Coyle, E. P. Keech and T. S. Waters a committee to confer with Dr. Mills.

Reading of papers and discussions being in order, Dr W. W. Evans, of Washington, D. C., chairman of the section on Artificial Dentistry read the following paper:

Gentlemen of the Dental Association of the State of Maryland and the District of Columbia:

I am about to do for my section what I have so frequently criticised in others—slight it. Owing to ill health in the past year and inability to get assistance from some members of my section whom I counted upon, I am lef really without material to work from, unless I make a "rehash" of what I have already laid before this Association in past years.

I have advanced the principles frequently of makin Artificial Dentistry a specialty, and of administering practical, educational facilities to students in our college; and I am now more convinced than ever of the necessity o such a step, since visiting abroad and noting the primitive state of conducting this branch. And yet I saw manipulative skill (jewelry work) that had it been intelligently, artistically directed, and the *workman* allowed entirely (that i to say, handle the patient as well as the plate) would hav produced marvelous results.

I am glad to note that in the past two years we hav advanced in this branch very materially. The manufacturers are meeting us more than half way, and the college have gotten so far as to make more special notices in thei catalogues.

A valuable acquisition to our dental literature, and particularly so in Dental Art, is Dr. Kingsley's late wor entitled "A treatise on Oral Deformities as a branch o

Mechanical Surgery." Although practically deficient in many points and slightly arrogant in tone, it is nevertheless very rich in valuable matter connected with Artificial Dentistry. It will give food for thought, especially so by dwelling on the chapter devoted to "Aesthetics of Dentistry," and should be found in the possession of every dental student as well as in the library of all lovers of Esthetic Dental Prosthesis. We have too few works of this kind, to afford to throw them aside without notice. I also understand, that there is just out a revised edition of "Richardson's Mechanical Dentistry." As I have not seen it, I cannot criticise its merits or demerits.

We have among the improvements and matters new to the profession in the past year—Dr. Campbell's New Mode Heater for Celluloid or Vulcanite, Dr. J. B. McPherson's Articulator, and a compound of pink wax and paraffine, rolled very thin for making up base plates, by the firm of S. S. White. They are all valuable acquisitions in their way to one neglected branch, and go to show the marked improvement of our profession.

The first is likely to establish the permanent claims of Celluloid, which is fast taking the place of Vulcanite. As we learn to manipulate it more thoroughly, with the advantages possessed by Dr. Campbell's apparatus, viz., the peculiar dry heat produced by steam, which makes it almost impossible to burn your plate; (wherein lies one of its greatest troubles for durability) preserves the color much better; produces a harder surface and is less liable to warp, we must succeed in time in producing a long needed base material, where single teeth alone will be required, for it is to be heartily wished for, that the day is not far distant when what is known as block teeth, or sectional gum teeth, will be entirely dispensed with. Not but what they can be produced to closely imitate nature, but the extra delicacy of carving and trimming, the number of blocks destroyed by warping, &c., &c., would compel the manufacturers to ask more than the ninety-nine out of the hundred dentists would be willing to pay for; thereby makin the sales unprofitable. Then again, they are scarcely appl cable for anything but full cases, whereas the single teet admit of the most artistic arrangement, approximatin nature so closely, by skillful manipulation, as to def detection in the mouth of the most critical observer. Th improvements also in this class of teeth have been ver decided of late.

I had hoped to show some specimens at this meeting, gold and platina plates in combination with celluloid, th I believe is entirely new to the profession, which we wi have to put off for the present, as I have not had time t get them up. With rubber also, celluloid makes stron durable work and very beautiful.

The wax mentioned above for base plates is wonderfull tough and pliable, and is just the thing we want in mani ulation of celluloid; being semi-transparent and of a shad approximating the natural gum allows me to see the line of the mouth on the model and admits of fine carving.

Last though not least, is the subject of pivot teet Building up contour gold crowns with foil, and putting o crowns of swedged plate metal, &c., may be very prett for dentists to admire, but I think, that we can simplify, a well as beautify our patients mouths if we can mount upo the old roots, porcelain crowns of some kind, to mor closely imitate their articulating neighbors.

People are becoming tired of these long tedious oper tions, as well as unwilling to pay the fee we ought t receive for a well executed contour gold crown. What i known as the Richmond plan is quickly executed so far a the patient is concerned, but has many drawbacks, not leas among them is their unsightliness. An article by Dr. W G. A. Benwill, published in the August *Cosmos* of this yea contains some valuable suggestions, worthy of discussio

In closing I can only tender an apology for this hastil put together and abruptly ended paper.

Under this head Dr. Reese, of Brooklyn, exhibited som specimens of artificial work made on gold alloy base, and explained the manner of working the same.

Dr. Atkinson said the main feature of the gold alloy base is, the relation it holds to the conductivity of the tissues. He thinks it the best material in use for dental plates. Artificial dentistry was then passed.

Dr. Winder read a paper on food stuffs as a power, which was read by Dr. Cutter, of Boston, at the meeting of the Association held in Baltimore, in 1879, [see AM. JOUR. OF DENTAL SCIENCE, Jan. 1880, p. 407,] and discussion postponed until this meeting because of a want of time to do it justice. After which the meeting adjourned until the evening session.

Evening Session.

The Association was called to order by the President.

Dr. Atkinson said he wished he had the time and the members the patience to take the paper and separate from the chaff the good grains of wheat in it, and get the flour. He said that there are a few very valuable things and some historic statements which are reliable. There is a deal of fancy and much good, but more of rich classification. He objects to some of the terms used, saying he had yet to learn of any acid called "saccharic" acid, and that there is no such thing as "diseased nutrition."

Dr. Winder.—I must say I feel very thankful that this paper has been presented. It covers the modes and functions of animal life, and is one of the most important subjects that can be brought to our attention. There are some positions taken by Dr. Cutter in this paper which I consider very questionable. But I am not disposed to cavil on these points. I am disposed to take the paper as a whole, as one of deep research, study and reasoning, and permanent value. The most important bearing which this paper has upon our profession is the question of food stuffs as therapeutic agents, a subject fruitful of suggestion.

Dr. Walker, of New Orleans, begs me to recommend to this Association the use of lime water for teeth of poor structure, but I do not believe that it has any effect whatever. In the first place I do not find that the osseous system in lime-water districts is superior in any respect to the osseous development in districts not thus characterised. If I had any evidence that teeth were better in lime-water districts I would accept Dr. Walker's statement as true. The secretions of the mouth also have much to do with this question of dental caries. There is trouble everywhere. What is salivary calculus but these very earthy salts? I ask myself the question, would nature so lavishly throw away the substances which she so much needed? Do we not see mouths in which are teeth of poor structure full of calculus? As a matter of statistical evidence the people of Louisianna have the best teeth in the United States, and those in Massachusetts the worst, and the latter have abundance of lime-water, while there is none in Louisiana. I hold that you must have a power behind these salts to assimilate them.

Dr Atkinson.—It is better for us to know a little and know it well than try to grasp a great many fanciful notions. What is food? We are told it is that which supports the organism. If it acts as food you must necessarily be healthy. When you become unhealthy, what is it? You have been poisoned. If you will take any substance that will correct and regulate, it becomes medicine, and medicine itself must be food. The subject was passed.

The president appointed as the committee to prepare communications for the papers of Washington and Baltimore, Drs. T. S. Waters, E. P. Keech and S. H. Williams, of Baltimore, and J. C. Smithe, R. B. Donaldson and J. B. Ten Eyck, of Washington.

Dr. W. H. Atkinson read the following paper on Histology and Microscopy:

The early records of histological knowledge originated from crude observations, made by the unaided use of the natural visual powers. From these arose the forms of physiological pronouncements in pathological formulæ known as Solidal, Humoral and Neural pathologies.

First. Solidal Pathology; or that based upon the supposition that function was the act of the solids of the animal body.

Second. Humoral Pathology; or that arising from the conception of the fluids of the body being the seat of functional activity.

Third. Neural Pathology; or that resulting upon a discovery of the nervous system as the channel through which function was induced. These three, so-called systems of pathology are all true in a sense as aspects of systemic or bodily performance of function.

Then, as now, men were apt to consider that which they perceived at the time to be all there was to be known. Hence the bitter contentions and controversies which mark the growth of Physiology in every age previous to the discovery, manufacture and use of the *Microscope.* So soon as this occurred a new field was opened up for better observations and closer discriminations than had been possible theretofore, (aside from inspirational methods of intensified minds.)

In seeking for the factors of function, generalizations and specializations become necessary to a classification adapted to the facts presented in the bodies under examination. And the bodies themselves must be subjected to methods of determining likeness and difference, so as to classify them in serial order to enable us to recognize shape, size, density, position, etc., etc., all of which conspire in fitting the parts to become the whole of the tissue, organ or body upon which we are making our study.

A wise use of the microscope is able to reveal the tissues, but not the elements of tissues. Ratiocinative methods only are adequate to the task of dealing with Mass and Energy, the confluence of which conspire to produce an unseen germinal outlay of tissual, organic, and systemic conformation, so beautifully revealed to the natural and microscopic vision in the study of Embryology.

Until 1872 *Protoplasm* was reckoned as an amorphous mass of indifferenced possibilities out of which tissues took their rise in some occult manner. After that date, no one conversant with the investigations of Carl Heitzman, now of 37 West 45th St., New York City, can longer exclude protoplasm from the category of formed and forming tissue; for he has proved its reticular (saccular) structure which every competent microscopist can verify for himself.

Histology is properly the *science* of weaving, or web-making, if we confine ourselves strictly to the legitimacy of the term. Therefore there must be the warp and the woof of which to weave the web of tissue, which is the material out of which webs and organs are constructed. This material is known as protoplasm, and is the resultant of complete digestion and admixture of food into an homogeneous—heterogeneity of substance. Just at what point of the digestory process we may be entitled to properly call it protoplasm requires very close discrimination to determine. In a general way the juices of the flesh have been called "pabulum," and "protenaceous compound," which is the prepared mass—substance from which the various tissues are derived, and by appropriations of portions of which they are nourished and kept in working order. So occult is this process of untried activity, that any tissue being debilitated or in need of nourishment (and in reach of protoplasm) will appropriate this same mass-substance without any loss by metamorphosis of the molecular mass; each element finding its special affinity awakened and engaged to build or nourish the weedy territory, without deficiency or excess of mass or energy, so that no debris whatever is present at the point of metamorphic exchange of the molecular mass as a whole or as a part of the bodies of which the corpuscles which go through the marvelous transformations into embryonic corpuscles—

protovertebræ—nerve-plates, muscle-plates and bone plates, from which are constructed the Nervous, Muscular and Osseous Systems. In fact all the other tissues of the whole body are but ripening and ripened careers of this one tissue protoplasm, without which we can have none of its derivatives.

Epithelium is nothing but slightly metamorphosed protoplasmic bodies, now called embryonal corpuscles. The three embryonal sheets known by the names Epi-blast, Hypo-blast and Meso-blast, are nothing else than continuous layers of these embryonal corpuscles folded in upon themselves so as to present us with clefts which are the beginnings of the Alimentary, Respiratory, Circulatory and Genito-Urinary tracts. The head fold, the tail-fold and yolk-fold present us with the body-walls and visceral-walls, the head-fold becoming the mouth, the tail-fold the anus, and the yolk-fold the umbilicus. All, as before said, without debris occurring anywhere until it is produced by the perfection of the digestory tract.

Dr. Winder.—Mr. President, the gentleman has left no room for criticism of his paper. He is too orthodox to leave himself open for criticism. For myself I should not like to attempt to criticise a paper by Dr. Atkinson on this subject. If there are errors I am not well enough informed on the subject to attack and expose them. I endorse it fully. There is in it an infinite amount of matter condensed in a very small space. I do know that Dr. Atkinson has been a close student on this subject for a great many years. The subject was then passed.

The sections then elected their chairmen with the following results:

Sec. 1. Surgical and Operative Dentistry:
Dr. J. B. Ten Eyck.
Sec. 2. Metallurgy and Chemistry of Metals:
Dr. R. F. Hunt.
Sec. 3. Artificial Dentistry: Dr. T. S. Waters.

Sec. 4. Dental Education and Literature:
Dr. J. B. Hodgkin.
Sec. 5. Anatomy and Physiology: R. B. Winder.
Sec. 6. Histology and Microscopy:
Dr. W. H. Atkinson.
Sec. 7. Pathology and Etiology: Dr. E. P. Keech.
Sec. 8. Diagnosis and Therapeutics:
Dr. H. C. Thompson.
Sec. 9. Chemistry and Materia Medica:
Dr. W. H. Atkinson.
Sec. 10. Not having reported, no chairman was elected.

The President announced clinics for the following morning and the meeting adjourned.

[TO BE CONTINUED.]

ARTICLE II.

Pivot Teeth.

BY CHAS. L. STEEL, D. D. S.

In Harris' Dictionary of Medicine and Dental Surgery we find a pivot tooth defined as "an artificial tooth designed to be applied to the root of a natural tooth, by means of what is usually termed, a pivot, but more properly a dowel or tenon." He then adds, with what may seem sarcasm to many practitioners, especially young ones, "Also, a tooth thus applied," for there is certainly a great difference between a tooth *designed* to be "thus applied" and one "thus applied."

Pivot teeth are certainly a great advantage when only one or two teeth are missing, as they save the annoyance and possible injury of wearing a plate. Then, too, if we have a healthy root to which we can attach a tooth, we can give a more natural appearance than can be done with a plate. But on the other hand, they have their disadvantages, for some, especially those attached by wooden pivots, absorb the fluids of the mouth and soon become offensive.

Then, too, they are not very permanent. Though we may occasionally find one lasting through many years, yet it will be an exception, for the natural root, having lost its principal centre of nutrition, the pulp, is nourished only by the periosteum and so gradually becomes entirely dead, and, sooner or later, will be expelled by nature; or, again, the root, becoming diseased, suppuration may set in, causing much trouble in the surrounding tissues, which, if not checked, may induce caries and necrosis of the bone.

Pivots are made either of wood or metal. If the former is used it should be of well seasoned and compressed young hickory, as this wood is stronger, tougher and more durable than any other. The fact of its being compressed allows it to absorb more moisture and therefore swell more and fit tighter. Various operators have different ways of inserting pivot teeth, and, strange to say, many still adhere to the old-fashioned style of using wood. The operators who advocate this practice, claim that the wood will absorb the moisture, swell and retain a tooth more firmly than will a metal pivot. But it seems to me that this same moisture, which is absorbed, will favor the decomposition of the wooden pivot, giving rise to offensive odors and causing the pivot to give way in a comparatively short time; then, again, the swelling of a wooden pivot has been known to split the root of a tooth; so I am almost inclined to fear that the dentists who use wood do so in order to avoid the slight extra labor of getting up a tooth with a metallic pivot. In Harris' Principles and Practice, a method of encasing a metallic pivot in wood is given. It seems to me that we here get the benefit of the objectionable features of the wooden pivot, without any of the advantages of the metal. The chief objection which has been urged against metallic pivots is that they wear the tooth substance with which they come in contact; this it seems to me can only become an object when the tooth is constantly removed from the mouth; but if the tooth is properly inserted with perfectly closed joints, it seems to me that its removal is perfectly unnecessary and, in fact, rather objectionable. Teeth attached by metallic pivots are, in my opinion, much nicer, more durable and more cleanly than those attached by wooden pivots.

Tomes, in his Dental Surgery, says: "If the canal is necessarily large, the wood pivot will be preferable." It is with great hesitancy that I presume to differ with such high authority, but *I* should say, if the canal is necessarily large, *always* use a *metallic* pivot, and for the following reasons: when the canal is very large the walls of the roots are proportionally thinner and therefore weaker; now the larger the canal the more wood there will be in the pivot and the more moisture it will absorb, therefore the more liable it will be to split the root, especially as the walls of the root are weaker. In the second place, the increased amount of wood present is more liable to give rise to an offensive odor. I suppose Tomes recommended wood because it would be difficult to adapt a metallic pivot to a large canal, but in a case of this sort, after carefully cleansing the canal and closing the apicial foramen with gold, the remaining portion may be filled with amalgam and in this a hole may be made of whatever size the operator may deem best. Some may say that the contact of the gold pivot with the amalgam might give rise to galvanic action, but I hardly think that would be found to give much trouble, especially in a pulpless root, and even if it were possible, the connection between the two metals may be broken by gutta percha in a way which I will speak of later on in this paper.

Superior central incisors are the teeth which are oftenest successfully pivoted, the lateral incisors sometimes being too small to pivot well; the cuspids usually being the last teeth to be lost, seldom require to have their roots pivoted. Bicuspid roots are sometimes pivoted, but unless the artificial crowns are quite firmly secured, the force of mastication is very liable to loosen them. Then, all bicuspid and molar roots are more liable to be expelled by the efforts of nature than the roots of the six anterior teeth. So noticeable is this fact that some authors have claimed that the anterior roots are endowed with a greater degree of vitality from their periosteum than the posterior. The lower incisors are very seldom pivoted as they are so small that they are difficult to pivot securely and then one would not be very much missed if lost. The first step in pivoting teeth is the preparation of the root. We will suppose a tooth to have been broken off, the remaining portion of the crown should be cut off with small saws or the excising forceps; in using the forceps care should be exercised not to take hold of too large a portion of the tooth at once as this produces a jar, which not only causes unnecessary pain to the patient, but may also induce so much irritation that destructive inflammation will be set up. When the crown has been cut off near the gum, a half round file or, better still, a corrundum wheel in the dental engine, may be used and the root cut off a little below the free margin of the gum, and so as to cause it to present a concave surface. The canal in the root should now be nicely cleaned out and if there is any disease about the root, it should be perfectly cured before any attempt is made to attach the artificial tooth. We should never attach any artificial crown to any but a *perfectly* healthy root. The canal should now be reamed out for about one-fourth of an inch of its length, until its diameter is about one-sixteenth of an inch, and should be nicely filled from the apex to the point to which the pivot is to extend. If the pivot is to be of wood, we must now select a tooth of the proper size, shape and color, and of a kind manufactured specially for pivoting with a hole for the pivot opposite the canal in the root; this tooth is now ground until it fits accurately against the exposed surface of the root. A piece of young hickory wood should now be taken and trimmed until it is almost, but not quite small enough to go in the canal; this should now be passed through a smooth hole in some hard substance, in order to compress its fibres—one end of this wood is now wedged into the hole in the artificial crown and cut off as far from the tooth as the pivot is to extend into the root canal. A very good, though expensive, and troublesome method is as follow:

After preparing the root as above described, take a piece of gold wire, either square or round, not quite so large as the cavity in the root; burnish around this a piece of thin platinum, forming a tube of platinum in which the gold wire fits perfectly; withdraw the wire and solder the platinum together; replace the wire and insert the tube with pivot enclosed; now fill around the tube with cohesive gold and allow the gold to cover the whole surface of the root, thereby protecting the root from decay, and holding in the tube; now select a thin plate tooth of the proper size, shape and color, grind it until it fits the surface of the gold cap and surrounding gum exactly, then solder a backing to it; now take an impression of the gold covering the root, get up a die and counter and swage a platina cap to accurately fit the exposed surface of gold; in this platina cap, cut a hole through which the pivot may pass; place the pivot, cap and tooth in position; now press soft wax against the tooth and platinum so as to hold them together; withdraw the pivot and tooth from the mouth, invest them in plaster and asbestos, and solder them. After finishing this up properly it is ready for insertion in the mouth. The pivot must fit in the tube as accurately as a ground joint, or the tooth will not be sufficiently firm. The pivot may be made of two pieces of an alloy of gold and platina which is quite springy; after fitting this to the tube and attaching the tooth as before, the two parts of which the pivot is composed should be slightly sprung apart and when inserted in the tube, they will act as a constant spring, holding the tooth tightly in place. This is unquestionably a nice operation and especially adapted to cases where the nerve canals have been much enlarged, but if it is very troublesome work, and unfortunately we seldom find patients willing to pay the fee which it is worth, so, for all practical purposes, I think the following method answers every purpose and is certainly much simpler. Prepare the root and ream out the canal as before. Now take a piece of platina or gold wire a shade smaller than the canal and fit it as high up in the root as it is desirable that the pivot should go; allow the wire to extend about one-eighth of an inch below the root; now while the pin is still in take an *accurate* impression of the exposed surface of the root and one or two of the adjoining teeth; the pin will be drawn away with the impression and from this must be secured a model of plaster and asbestos. When this is separated from the impression the pin must remain in the model; now take a piece of very thin platinum, punch a hole in it to allow the pin to go through and then burnish this platinum over that part of the model which corresponds to the exposed surface of the root in the mouth; cut off the projecting portion of the pin. A suitable thin plate tooth having been selected, grind it to fit closely against the root and surrounding gum, retain it in position with wax, invest the whole and solder the pin, plate and backing together. When this is nicely dressed up it is ready for insertion in the mouth. To do this, warm the pin and coat it with Hill's stopping, warm this until it is quite soft and then press the pin firmly up until the tooth is in the proper position, and when the gutta-percha is hard, the surplus may be cut away. A few notches should be cut in the pivot and one or two grooves in the canal in order to assist the gutta-percha to retain the tooth in position. The gutta-percha makes all joints perfect and, being covered by the free margin of the gum, it will preserve the root from decay almost indefinitely. If the pin, plate and backing are all of platinum the soldering may be done with pure gold, and I think this preferable. In making the cap for this case I burnish the platinum over that part of the model corresponding to the exposed surface of the root in the mouth. This can often be done satisfactorily, but for greater accuracy, it is always best, in making these caps to swage them on a metallic die.

The Bonwill Crown is applied as follows: porcelai teeth are made specially to be applied in this way, wit a hole of considerable size opening on the palatine surface of single rooted teeth and on the grinding surfaces of teet posterior to the canines. The root is prepared as in th cases previously described: the tooth applicable to th case in hand is then selected and ground to accurately fi the root; a gold or platina wire is now fitted through th whole in the artificial tooth and extending up into th root; the tooth is now withdrawn and the pin fastened i the canal with some filling material; the tooth is now pu in position, the wire extending into the cavity in the tooth this is now attached by means of some filling material; D Bonwill, I believe, recommend amalgam. In attachin bicuspid and molar crowns, a wire is fixed in all th roots and these wires bent together, forming something o an arch in the cavity of the tooth, helping to retain th crown more securely, when the filling material is inserted

A favorite method with some operators, amongst whon may be mentioned Dr. Foster and Dr. Marshall H. Webb is to solder a wire to the pins of a suitably prepared thi plate tooth, place the tooth and wire in position and retai them in position by building around the wire with cohesiv foil; the palatine surface of the tooth is then contoure with cohesive foil. While I do not know that they come under the head of what is usually meant by a pivot tooth yet I do not think this paper would be complete withou some mention of the extremely nice operation resorted t by some of our profession, of inserting one or more artificial crowns, where the roots have been lost, by attachin them to the adjacent teeth, thus doing away with the necessity for a plate covering the mouth. To suppose an extreme case, let us say that the four superior incisors roots and all were gone. We would first take an impression of the part and swage a plate to fit the ridge to be occupied by the teeth. Solder the teeth to be inserted to this plate and have extensions from the backing of the laterals to go into cavities cut in the cuspids; put this in position in the mouth and fill the cavities which contain the extensions, with gold. This, when well performed, makes a very nice operation.

ARTICLE III.

Address to the Graduating Class of the Baltimore College of Dental Surgery.

DELIVERED BY REV. WILLIAM KIRKUS, M. A., LL. B.

It would have seemed far better to me, gentlemen, if the duty that has been assigned to me had been entrusted to some one of the noblest and wisest of the members of your own profession. The wisdom of such a man, his experience, his success, his wide-spread renown, would have given weight to every word he would have uttered. He could have warned you, from his own knowledge, of the temptations which will beset you in the career that you have chosen. He could have shown you the traps and pitfalls which undoubtedly are hidden in the road on which you are to journey. He could have given you suggestions which would have helped you to tread boldly and safely, and to march on surely and perhaps even swiftly, to a dignified success. It is impossible for me to render you any such service. The life you will have to live is, in many respects, very remote from that with which I am myself familiar. I know nothing whatever about teeth, except that (fortunately for you) they must generally be numbered among the "ills that flesh is heir to;" nor can I render you the slightest assistance, even by way of suggestion, in your philanthropic endeavor to fortify, that *erkos odonton* about which you used to read in Homer. Nevertheless it is not for me to dispute the wisdom of your professors—I can only wish that the task which they have assigned to me had been entrusted to far abler hands. Perhaps it may be sometimes an advantage to receive honest and generous advice, or even criticism, from one who looks at us "without partiality and without hypocrisy;" one who does not belong to our own set; one who does not judge by our own standard; one who knows that there are other things worth living for besides those which are the objects of our own too exclusive pursuits. You are but men after all, even though you be dentists. There are even some physicians, as there are men in all professions, not excluding the clergy, to whom might be addressed without inappropriateness, the words of the immortal Venus in "Our Mutual Friend"—"you little know how small you would look if I had the articu lating of you." Or to put it more generously, and in words yet more familiar:—

> O wad some Pow'r the giftie gie us
> To see oursels as others see us!
> It wad frae mony a blunder free us
> And foolish notion:
> What airs in dress and gait wad lea'e us,
> And ev'n Devotion!

Or yet again, you may be so accustomed to your own work that you may forget its real dignity, underestimate its power, and so be in danger of missing that highest success which can only be achieved by men who believe in themselves and have an enthusiasm for their vocation.

I mentioned as one among many causes which may render me, I fear, a very inefficient counsellor to young physicians, that the life on which you are setting out must be in very many of its details exceedingly unlike my own. And yet on the other hand there are many points of strong resemblance; and perhaps the resemblance, being deep and general, may be more important than the differences which are superficial and in details. To begin with, then, we both belong to what are called the professional classes. It would be absurd, even to the verge of insanity, to underestimate or disparage the tradesman class. Not only does this include some of the very best men on the face of the earth, but their work itself—to say nothing of its absolute necessity—may be made, and often is made, in the very highest degree ennobling. Moreover trades are not separated from professions by any "hard and fast" line. When a hairdresser calls himself Professor Snippers, you inevitably set him down as a fool; though very likely he is a very excellent fellow and his wife never saw his equal. Nobody would call oyster packing a profession, nor speak of Crosse & Blackwell as Professors of Pickling. Unless indeed, with our modern notions of liberty, we felt free to invert the meaning of perfectly familiar words—or used the term professor with a covert irony—as we should do if we were to call Judas Iscariot a professor of devoted loyalty, or compliment an amœbus on its altruism. But there are large commercial transactions which require such vast and minute knowledge, such versatility, such large powers of generalization and deduction, such familiarity with the laws and usages of many countries and all classes of society, and in the long run, such sterling honour—that those who conduct them are justly ranked among the wisest and most cultivated of mankind. A banker may be, and possibly often is, a mere trader; but he may also be, and ought to be, familiar at least with the methods and results of political economy, with the theory of currency and exchange, and the innumerable forms and effects of credit.

But speaking broadly and without any pretence of a strictly accurate definition, the difference between a trade and a profession is this: that a trade is a mere instrument, the means to some end other than itself, whereas a profession is an end in itself. A tradesman is not generally—always taking for granted, of course, honesty, and average skill—responsible for what he sells. *Caveat emptor*—let the buyer look to it, is the motto that might be written up in large letters in every store. Moreover a storekeeper will sell you anything you want to buy. He will sell you a good article, if you will pay the price. But if you choose he will sell you a really bad article, which both you and and he know to be bad. It is your own look out. His object—and a very legitimate object—is to make money:

and therefore he must accommodate himself to the taste of his customers, however ridiculous or even mischievous those tastes may be. An honest jeweller will of course tell you whether his gold is pure and his precious stones genuine. But if you are so hopelessly mad that you would rather wear gilded nickel and coloured glass on your fingers than be suspected of having no jewelry at all—of course he will sell you that. But no physician could act in that way. His end is not money but his profession, his work, the cure of his patient. If he thinks some particular medicine necessary he will prescribe it; and if you are so ridiculous as to insist upon something else he will politely bid you good bye. Remember always, gentlemen, that you belong to a profession not to a trade-guild. If you do remember that, you will be both modest and dignified; you will be protected not only from the whims and caprices of others, but from the far more serious dangers which you will be not long in detecting concealed in your own hearts. What would you think of a Christian priest who, instead of delivering what he believed to be God's message to the souls of men, should first discover their own preferences and then, in the name of the Eternal, echo to them their own voices? And next in ideal nobleness to the work of him who brings divine messages to the spirits of men, is the work of him who brings the divine gift of healing to their bodies. If you should condescend to pander to popular prejudice, if you should sacrifice what is really good for popular applause, if you should be satisfied not with what is best but with what 'will do,' should you make it the end of your work not to bring health and healing to your patient but to extract fees out of them—then whatever your prosperity, whatever your reputation, whatever your wealth, you will have sunk into an abyss of unmeasurable infamy. I do not say, hate quacks as you would hate the devil—for indeed, apart from better reasons, you are likely to have enough of that feeling already—but I will say, hate quackery as you would hate hell.

Again—and perhaps this should have come first, for it is indispensable to your genuine success—never forget that you are *gentlemen.* And by this I do not mean that you are well-bred, that you came of a good stock, that you have hanging up in your library or office a stately genealogical tree. No doubt this would be a very great advantage. It is a splendid introduction; it gives a man courage, brings out his personal nobleness, and is a powerful stimulus to exertion. I have observed that the most democratic of politicians are often among the most aristocratic in society. It is a good thing to have a father to be proud of. But nevertheless, any defects or misfortunes of your birth it would now be too late to remedy. We may do much in a free country, but not even the Constitution of the United States can enable us to abolish the Multiplication Table or to change our fathers and mothers.

But by a gentleman—such as any of us may become—I mean an educated man, a man familiar with the approved usages of good society, a man who knows how to walk without treading on other people's feet, who knows how to talk without outraging other people's feelings,—a good-hearted, unselfish, modest man—a man not only ready to do a kindness, but also humble enough and generous enough to accept one—a man who "envieth not, vaunteth not himself, is not puffed up, doth not behave himself unseemly, is not easily provoked, thinketh no evil, rejoiceth not in iniquity but rejoiceth in the truth"—a pure man, with a clean soul and an undefiled life. Do not think that knowing all about teeth will relieve you from the necessity of knowing something about good books and great men. I once heard of a candidate for Holy Orders who spelt Peter, P E T R E, and felt himself deeply wronged because the examining chaplain refused to pass him. I once read a letter from an M. D. equally independent of Webster Unabridged. But really people have an invincible prejudice in favor of correct spelling, which you cannot afford to despise. If you spell like Sairey Gamp and Betsey

Prig you must not be surprised if people don't consult you. Why a well-educated girl might even, for so very simple and rudimentary a reason, refuse to marry you. What would Major Pendennis say to such a match? You remember his splendid strategy in rescuing his nephew from the too attractive Miss Costigan. "I *will* see her," said Arthur, "I'll ask her to marry me once more. I will. No one shall prevent me." "What! a woman that spells affection with one f? Nonsense, sir; be a man, and remember that your mother is a lady."

But, indeed, your profession will often place you in circumstances of extreme delicacy—requiring not only the manners but the feelings of a gentleman. We all of us remember the solemn awe with which we first surrendered our very windpipes to the glittering weapon of a hitherto unknown barber. What if he bore us malice for some unknown injury or slight! What if he were an unsuspected maniac! Think then, of the awe and dread of a blushing maiden surrendering her face, her mouth, her very teeth, to the grappling irons, or saws, or files, of a hitherto unknown dentist! Besides if you reside in some country town or village—and somebody must live in such places, and they even come to enjoy them—you will be one of the leaders of society. In the desert of a large city you might "blush unseen," but "down there" everybody will know you. You will be, or ought to be, not only a dentist but a social power. You may set a fashion—not in neckties, and tight-fitting suits and all the matchless perfections which distinguish that marvellous creature—that last and noblest birth of time—who is sometimes irreverently spoken of, in the gentle slang of the day, as a 'lum-tum'—not in all this; but in manners, in good sense, in solid worth, in courtesy, and refinement, and culture. Take care to do this part of your work well—and be in every respect a gentleman.

It may perhaps seem entirely superfluous to remind you that whatever else you are, it will unquestionably be necessary for you to be physicians. Of course, you know perfectly well what this means, but I am sure there are a great many people, and myself among the number, who do not. Of course we all know perfectly well what a physician's education should be; and if we did not know it otherwise, we might easily find it out by reading the regulations of your own college. Thus, for instance, we should find that your course of study includes Pathology, Therapeutics, Anatomy and Physiology, Chemistry and Materia Medica. Nobody of course suspects that you have confined your study to the structure of the teeth, or the mechanical appliances which are necessary for cleaning, stopping, extracting or imitating them. Whatever your private practice may be, it is to be presumed that you would be able, if you thought fit, to undertake the general medical treatment of any patient who might be willing to entrust himself to your care. But what I mean by uncertainty, as to what a physician really is, is something entirely different from this. What is it that gives a man a right to practice medicine—to undertake the care of one of his fellow-creatures even in a case of life and death, or where the comfort of a whole lifetime may depend upon his knowledge and skill? Now in England, where as you know, people have a very practical and humdrum way of doing things, people would never be content for a week to be left in any uncertainty on a matter of so much importance. First of all, there are exceedingly few institutions that are authorized to confer degrees in medicine. For England itself there are, as far as I can remember, only three; the Universities of Oxford, Cambridge and London. Indeed it is the University of London alone, which has devoted a very special attention to all departments of physical science. Anyone who looks down the comparatively short list of London medical graduates, will come across some of the foremost names in the profession; and I advise you to examine the list for yourselves, lest you should suspect me of partiality for a University of which I am myself proud to be a member. Almost everybody in England knows, that as a matter of mere business, a London medical degree is an almost certain introduction to a lucrative practice. But in England, not even a medical degree—rare as such a distinction is—confers a right to practice medicine; unless the law has been altered within the last eight years. Before a man can practice medicine he must take care to have his name inserted in the authorized register; and before he can secure this, he must obtain the necessary license from one or other of the three great medical corporations—the Royal College of Physicians, or of Surgeons, or the Apothecaries' Society. If without this authority he chooses to call himself a doctor, to visit patients, and to demand from them fees, he can be prosecuted for the very vulgar crime of obtaining money under false pretences. If in the care of a patient —through a surgical operation or a mistake of medical treatment—he should sacrifice limb or life, he would have no other protection than any private individual in defending himself against legal proceedings. An authorized medical practitioner in England, then, is a man whose name appears in a published list drawn up according to the directions and by the authority of an Act of Parliament.

[TO BE CONTINUED.]

ARTICLE IV.

Feeding of Nursing Children.

BY EPHRAM CUTTER, M. D., BOSTON, MASS.

In the May No., 1880, of this journal, Dr. Wiley gives an important practical article on infant feeding. On page 132, he pertinently says: "How much suffering would be avoided, how much medicine saved, how many lives spared, if children, from infancy to childhood, could have special attention paid to their diet."

I have always thought that the trouble was generally in the deficient lactation or functional derangement of the mamary gland. I have elsewhere (*American Journal of Obstetrics*, April, 1878,) in a paper "On Food as a Medicine in Agalaxia," given my ideas as to this subject. Still, to enforce the animus of Dr. Wiley's paper, I may, perhaps, express my opinion that, if man should treat the individuals of his own race as well as he treats his cattle, horses and birds, there would be no difficulty in this respect. It is a matter of history that the æsthetics of the senses govern man in the selection of food. We have naught to say against this—only to suggest that the other views of food, as the chemical, physiological, kinetic, pathologic and therapeutic, should not be ignored. This matter of agalaxia comes under the head of food as a physiologic remedy or promoter of functions. The subject is quite a broad one, and for its fuller development we beg to refer readers to a lecture delivered to the Maryland and District of Columbia Dental Association in September, 1879, and published in their *Transactions*. For our present purpose, it is only necessary to say that the dairymen of this country seem to have solved the problem of getting the full supply of milk that their herds can furnish. Experience has taght them that the food must be ample, in good condition, timely served, and contain all the mineral elements that enter into the constitution of milk. Allowance is made for differences in breeds and in individuals of these breeds; also, the kine must be sheltered properly. The animals have nothing to do but to spend all their nerve forces in the facilitation of the work of the epithelial cells of the mammary glands. They are kept quiet and free from worry and excitement. The dairymen do not consult the love of the beautiful of the animals in the selection of the food for their kine. The animals must eat what is furnished to them or die. I have no doubt, however, that the æsthetics of the animals are gratified, as wholesome food is generally beautiful to the senses. The secret of the feeding of kine to produce a good quantity of milk is, other things being equal, to give *whole* food—that is food that contains all the elements that the Creator has incorporated into the bodies of his creatures. It is a matter of philological interest that *hale*, *whole*, *health* and *holy* are all derived from the same root. In order, then, to make a perfect being, the diet must contain the entire circle of the elements. Fortunately for cattle, horses and birds, their ailments are *whole foods*. That is, they have suffered no dimunition in their normal elements.

But how is it with woman? It is a matter of history that their diet is mainly flour, sugar and starch. In the flour we have an imperfect, unnatural food. It certainly is not a whole food. In milling, for the sake of ensuring whiteness and lightness in the bread, a costly process has been pursued, in which there has been a waste of (Liebig says) three fourths of the normal mineral salts found in wheat. The reason of one is, that the gluten cells which are so beautifully disposed over the periphery of the grain of wheat contain coloring matter, and if retained, cause the bread to be brown or black in hue. We cannot explain why society has ordained that *white* should be the *æsthetic color in bread*. It is a matter of taste, but so it is; and the gluten cells that contain so much phosphorus and other mineral salts have to be removed to graitfy the behests of society's decision that bread is not good unless it is *white*. To put this more definitely: In Johnson's "*How Crops Grow*," many analyses are found. There it is stated that in one thousand grains of wheat. there are 8.2 grains of phosphoric arid; in flour, 2.1 grains of phosphoric acid.

Now, as milk is one of the most remarkable secretions, in the fact that it contains, or ought to contain, all the elements necessary to build up the body, how can we expect the epithelium of the mammary glands of a woman fed on flour to elaborate good milk if fed on an aliment from which three-fourths of the mineral matter has been withdrawn? But this she has to do, as a general thing. She has to make, as it were "bricks without straw." Is not this a physiological cruelty to her and her offspring? If dairymen did so with their cows, the society for the protection of cruelty to animals would arrest them. I have no doubt, in my own mind, such is the general use of flour, in the form of bread and other preparations, that the function of lactation is greatly impeded by it. For evidence see below.

The effect of feeding on flour exclusively was shown by Magendie years ago. He found that dogs fed on flour died in forty days; on no food they died in the same time; while dogs fed on wheat thrived.

Judge Abbott, of Boston, tells of some sailors wrecked at sea and obliged to live on flour alone. The effect was disastrous for them.

Sugar.—This is made up of carbon, hydrogen and oxygen—three elements. It forms a large moiety of the food of man simply because its sweet taste is so agreeable. To be sure it is found in milk, but it would be hard work for the epithelium of the mammary gland to elaborate milk from sugar simply, because milk has over sixteen elements. The bad reputation of cake comes from too much sugar. I do not think the shortening is harmful.

Starch, as such and separated, is much used as food. It also is found in flour; indeed, the trouble is, it is too large a constitutent of flour. It contains the same elements as sugar, and in digestion changes into sugar. Now, starch is a valuable and indispensable moiety of food when it is kept to its normal proportion, but when in excess it is not healthy, as seen in the cases of the dogs and sailors. It makes fat, and as such is good food for lactation. But it must not be in excess. It must have mingled with it enough of mineral elements to supply the chemical necessities of milk. It is supposed that the protoplasm of the epithelial cells elects or selects, if you please, the elements from the blood from which to make the milk. It does not create any new elements. Hence, the necessity of the conditions already stated—that the food must contain all the elements which the chemist finds in the human body.

Another idea is (one laid down by Dr. Salisbury) "that the animal, to be healthy, must have its natural food." This varies with the animal. Ladies observe this rule for their canaries. Stable-keepers observe this rule with their horses, and dairymen with their kine. But what is the natural food of mankind? Dr. Salisbury says two-thirds animal and one third vegetable food. I agree with him, and my judgment is formed from experience. If, then, man should eat the food found in nature in the above proportions, we should find health. Some may dissent from this doctrine, but we two witnesses testify that we have found it true. We do not class flour or separated starch and sugar as natural foods, since such are not found in nature.

From this we say that, if a nursing mother is put on animal food two-thirds and vegetable food one-third by bulk, she will have milk enough to supply the natural demands of her offspring. We have repeatedly tested this in practice, and our object now is respectfully to call attention to this every-day but important matter, so that obstetricians may see to it that their deliveries get the food that is their own natural and inalienable right; that lactation may be a normal and blessed process, and that the coming generations may get a good start in the world with nervous systems well fed, strong and capable of endurance.

Another thing—is it right for nursing women to have so much strain put on them in work during and after gestation? Mares with foal and cows with calf are allowed rest, but how often are women worked night and day close up to confinement, and after going through with severe labors are obliged to drudge again in the cares of a family? Is it a wonder our milk fails?

"ILLUSTRATIVE CASE.—A PRIMIPARA HAS TWIN SONS—FEEDS ON THE SALISBURY PLAN—ENTIRELY SUPPORTS BOTH—GAINS TEN POUNDS IN THE FIRST SIX MONTHS.—Miss

V. M. I., of Boston, aged 21 years, married and went to reside in the State of Maine. She weighed ninety-eight pounds. She was a women of fine, rare mind, small in size but symmetrical. At the age of seventeen she had a severe illness with typhoid fever, which left her with an obstinate catarrh, which was characterized by offensive, tough, leathery, nasal dejections. This was cured by the application of fuming acid to the site of the ulceration halfway through the nostril. In the course of her first married year she was delivered of twin sons; labor normal. She lived in a rural district, where neighbors feel an interest in such affairs, and she was visited from near and far by interested dames. It is proper to say that the uniform advice in relation to the "suckling" was *not to suckle them at all*, as it was predicted she could not suckle them long, at least. This advice shows, in general terms, that lactation is not always a success, and that nursing-bottles are in use in Maine. Now, the paternal grandfather of the twins was much interested that they should suckle. He therefore consulted me. I told him the sum of what has been here stated. At his request, I gave a type-writer's printed list of things to eat and not to eat. It included all animal and vegetable foods, excluding flour, starch and sugars. The animal food was to be two-thirds, and the vegetable one-third. This list Mrs. I. received, and went on, sustained and strengthened by her father's influence. It was faithfully carried out. At the expiration of six months, one twin weighed seventeen pounds, and the other weighed eighteen pounds. They derived all their nourishment from their mother's breast. They were the pictures of health, and unfailing sources of unmingled delight to all. I think I never saw more domestic happiness in a family than was here. The children, in place of being considered a nuisance, were, indeed, the greatest blessings and well-springs of joy."

This was a severe test for the diet—the straitest I have known. I may fail in some other like cases, but I have never failed in single births to secure an abundant supply of good milk simply by feeding the mother on the same general principles of dairy feeding.

It is unpleasant for women to be compared to cows. But the non-æsthetic nature of this idea should not be allowed to overbalance the teachings of history where it is of the first importance for infants to have good bones, muscles, nerves and organs with which to fight the battle of life.—*Vir. Med. Monthly.*

ARTICLE V.

Our Dental Literature.

The following remarks of Prof. L. Ashley Faught, D. D. S., before the Odontological Society of Pennsylvania, are interesting and to the point:

Convinced that our profession might be benefited by a retrospect of its literature, I presume to offer some remarks upon this subject from the critic standpoint. I am well aware that such position is unenviable, but a work wrought for my own benefit has developed so many facts of peculiar interest that I feel impelled to make a statement of them to the profession.

For several years I have followed and compared the writers and writings of the day to note the progress of dentistry. In my studies of the writings it seemed to me that chaff exceeded wheat; while with writers it seemed that echoes exceeded the voices.

Upon the cover of one of our journals we find these words: "Observe, compare, reflect, record." A glorious and effective motto. How has it been heeded by the profession? The word "record" seems to have been all that has been noticed. The suggestive gradation from observation to comparison, from comparison to reflection, has been almost totally ignored. Record! Record!! To record everything, valuable or valueless, and publish it too, has so become the act of our contributors that doctrine and originality of idea consequent upon investigation is fast becoming obsolete. If they would but ponder on the quadruple motto as an entity, and grasp its powerful truth, I am sure that the savor of freshness would greet us as we perused the pages of future dental journals; for observation would open the way to hidden and unknown things; comparison would prevent the repeated publication of ideas already well expressed; and reflection would so imbue the dental mind with the sanctity of the space in the media of publication, and with the value of the time of our societies, that no one would dare to trifle with them as at present, but would only occupy as he had something which was new and worthy of presentation.

I admit that repetition of old ideas was once needed, but claim that the day has long passed. In earlier times our journals were the sole disseminators of knowledge, but now we have adequate colleges to train those entering upon active practice. These should be, as it were, the primary and secondary schools, so that the journals might become the normal and university. The students of the profession should be trained by our present college chairs, or by the establishment of a new one—that of dental literature—and by adequately prepared text-books, in all that has been presented to the profession, by all writing up to the date of their graduation. It should be the work of the professors or professor to thus send them forth fully acquainted with the past, and fully prepared to comprehend and contribute to the writings of the future. Journals then need only contain that which is new since their last and up to their immediate date of issue. Under this condition of affairs practitioners would eagerly look for them, and, turning their pages over and over in study, would thus keep upon the crest of the wave and ever be ready for progressive work. The occupants of professorial positions, securing this material as it in turn became old, would incorporate it in their lectures to the coming recruits. Thus would the wheels of dentistry assuredly roll onward.

In order that this retrospect may not become voluminous, I will confine my observations to the *Dental Cosmos*, as a typal journal and of largest circulation, and to the years from 1872 to 1880 inclusive.

Carefully enumerating and tabulating, I have discovered that of the twelve thousand dentists in the United States only three hundred and thirty-four have, in the nine years, contributed anything to its pages, and even this small number is attainable only by including every member reported as having made remarks in a dental society! Of this contributing, twenty-five have done more than one-third of the work, and fifteen of these occupy positions as teachers in dental institutions. From such we naturally expect to hear, as they are supposed to be gathering material in their experimental work as instructors. Can it be possible that there are only ten active minds in the private ranks of the profession of dentistry? And yet it seems but reasonable to infer that *workers* will desire the widest promulgation of their labors.

Making an exception of two serials, which were copyrighted for after publication as text-books, I have also found that the number of subjects thus presented during the above stated time is one hundred and thirteen. They may be classified as follows: Speculative, sixty-eight; relating to materials and drugs twenty-five; manipulative, fourteen; pathological and therapeutic, six. By this classification we see that the bulk of matter,—speculative,—even though it were handled in a masterly manner, is at best of questionable value.

The subjects receiving the most attention were: "Sixth-year Molars," "Eclectic Dentistry," "Neuralgia," "Caries," "Conservatism," "Doctor," "Pulpless Teeth," "Exposed Pulps," "Sensitive Dentine," "Contour Filling," "Creosote" and "Amalgams." What a record is this when we consider the broad field of Dentistry!

Carefully analyzing the papers and comparing them the following facts have been elicted:

First. It is noted that the same practitioners, when writing at intervals on the same subject, not only state the same ideas, but in many instances present them by phraseology absolutely identical.

Second. In views relating to special subjects advanced by different practitioners a marked similarity is constantly observable. For instance, in articles upon "Exposure of the Pulp," the same ideas are stated and restated by different persons. Almost all papers upon it consist of a stereotyped discussion of merits of creosote, oxychloride of zinc, and Hill's stopping, with an occasional reference to the temperament of the patient, the condition of the pulp at time of capping, and the length of time of probation.

Third. It is seen that a large bulk of the matter in papers published is taken from text-books.

Fourth. It can be shown that many of the views advanced as dogmatic truth are so totally unscientific as not only to subject the enunciator but also his profession to open ridicule. For instance, in September, 1878, a gentleman is reported as having said, ". . . our modern amalgams have not the preservative quality of the old, which was due to the copper salts which they contained;" while a request in the October number, that he would state the names of these salts, and explain why they could not be incorporated in the less preservative modern amalgams, failed to elict a reply. Again in November, 1880, a gentleman is reported as having said, ". . . and in all these cases carbolic acid ought to be placed in the cavity to disinfect the carious dentine and coagulate the protoplasm weeping from the fibres of living matter in the exposed dentinal canaliculi;" while it is believed that the scientific world of to-day does not recognize the use of the word protoplasm, which in former years was employed to express the contents of a vegetable cell, the granular matter around the so-called nuclei of muscles, and the moving matter of the colorless blood corpuscles. For the sake of showing further error let us apply these ancient meanings to the words used. The gentleman certainly did not refer by it to the first two. He must therefore have meant the latter one. This is incapable of coagulation, and. as living matter itself, possesses not the possibility of weeping from other living matter. Other points in the expression quoted, besides these mentioned, render the sentence extremely vague, mythical, and questionable.

In conclusion, I trust that those who have been reading with the blissful feeling that they were progressing will "reflect" upon the points I have mentioned, and, remembering that if our journals do not bring us new facts in the future the fault is not with the editors but with ourselves, will stop this heterogeneous writing on anything and nothing, and as a first principle resolve to publish no paper or remark unless it be the result of observation and experimentation, and is thought to contain a newly discovered fact worthy of record.

ARTICLE VI.

Heveenoid—The Rubber of the Future.

We condense the following from a pamphlet written by Prof. Henry A. Mott, Jr., and published by Trow's Printing and Book-binding Company, of 201–203 East 12th street, New York:

Heveenoid is the name of a new product which is destined to supplant the soft and hard vulcanized India rubber which has for so long a time supplied the market. The base of Heveenoid is India rubber, whence the name, from *heeven*, the name given by the natives of South America to the milky juice of the India rubber tree; and *oid*, a Greek termination signifying *like*. The combination of this base with camphor vulcanized by sulphur constitutes *Heveenoid*. The discovery of Goodyear and Day, that sulphur will vulcanize India rubber, first made this substance of value in the industrial arts. While this discovery must always be looked upon as one of great value, the discovery of the new product, Heveenoid, by Henry Gerner, opens a new era in the rubber industry, and will, unquestionably, to a very great extent, in time, take the place of the vulcanized rubber of to-day.

The proportions of the constituents to make a soft and hard Heveenoid may be approximately given as follows:

Rubber	2 parts.	3 parts.
Camphor	2 "	2 "
Lime	1-16 "	——
Glycerine	——	½ "
Sulphur	¼ "	8 "

Para is best for hard Heveenoid, while Nicaragua rubber answers very well for soft Heveenoid, and, in fact, is somewhat more adapted.

It is a well known fact that sulphur will only combine to a very limited extent with rubber, only about one to three per cent. entering into chemical combination, the remainder of the sulphur added existing only in mechanical suspension. This fact is proved by two simple experiments —*first*, one or two per cent. of sulphur is sufficient to vulcanize with, and produce the change; and *second*, if vulcanized rubber is ignited, instead of burning with a steady, smoky flame, it throws off sparks of ignited sulphur, and if the flame be extinguished, the sulphur will be seen to solidify. The odor also of sulphurous acid is very marked. This is not the case with Heveenoid; all the constituents of this new product are chemically united. The sulphur unites with the camphor, forming a sulphide of camphene, which either dissolves or is dissolved by the rubber; it seems, however, more probable that the former is the case.

The temperature at which the constituents unite chemically is just above the melting point of camphor. In the manufacture of ordinary rubber, if too much sulphur is added the product is hard and brittle. If such rubber be placed and left sufficiently long in molten camphor it swells up, and combines with the camphor, acquiring toughness and flexibility, and becomes, a desirable material; in other words, it becomes Heveenoid.

The process of manufacturing Heveenoid, is, of course, patented, the patent being held by the Heveenoid Manufacturing Co., of New York. At Hoboken, N. J., works are erected sufficiently large to make over three thousand pounds of stock a day. This Company, however, only manufactures specialties, and sells licenses to other companies. The great consideration in favor of Heveenoid is the fact that it can be manufactured, and put on the market for about thirty to fifty per cent. cheaper than the ordinary vulcanized rubber.

The properties of good vulcanized rubber are: Elasticity, pliability, durability, insolubility, unalterability by climate, or artificial heat or cold, inadhesiveness, impermeability to air, gases, and liquids, odor, plasticity, facility of receiving every style of printing, facility of being ornamented by painting, bronzing, gilding, japaning, and mixing with colors, non-electric quality, spreading quality.

A thorough investigation into the merits of Heveenoid, which I have had occasion to make, developed the fact that Heveenoid not only possesses the above mentioned properties of vulcanized India rubber, but in many instances possesses them in an infinitely superior degree. As for example, Heveenoid is far more pliable, durable, and insoluble than ordinary India rubber. Being a chemical combination is less impermeable to air, gases and liquids. As regards odor, it is far superior to vulcanized rubber, which, as is well known, possesses a very disagreeable, sulphur odor. Soft Heveenoid smells of camphor, which renders it of great service as a moth and insect destroyer. Its application for lining of closets or wrapping of furs, etc., as also for submarine cables opens a large field for it. Hard Heveenoid, when rubbed or when warm, has a slight odor of camphor, but it is not noticed unless under these conditions—the odor being pleasant, is much to be preferred to the old sulphur odor. Heveenoid possesses a great value over rubber in the manufacture of jewelry, as the sulphur, being in chemical combination, permits of the use of poor as well as fine gold in ornamenting it. None but eighteen carat gold can be used with the ordinary vulcanized rubber, otherwise, owing to the free sulphur in its composition, the gold would change color. As regards coloring, Heveenoid, is far superior to rubber, as it may be colored any desired tint. This is something which the manufacturers of rubber have often attempted to do, but have utterly failed.

Another property Heveenoid possesses is the facility with which it can be sawed and designed. A saw may be used with Heveenoid for from one-half to three-quarters of a day without being sharpened. The sharpening of saws in the working of ordinary vulcanized India rubber is a matter of great expense, as they must be sharpened about every half hour. It is the friction of the saws against the uncombined sulphur in India rubber which dulls them; the sulphur in Heveenoid being in chemical combination, can offer no such frictional resistance.

The discovery of Heveenoid will certainly give rubber and camphor a much wider application in the arts, as this new product is adapted for many new purposes, where ordinary India rubber would be useless. It seems strange that the combinations of gum camphor with rubber had not been thought of before, especially when the fact is considered that Goodyear obtained his first patent in 1844, nearly forty years ago. The only way it can be accounted for is the fact that the India rubber business has been a monopoly, and like most monopolies, original investigation in the line of improvements have been prosecuted only to a limited extent. The merits of Heveenoid are such as to indicate an exceptionably profitable future, both as a benefit to the industrial arts and as a business of itself.—*Odontographic Journal.*

ARTICLE VII.

Correspondence.

Mr. Editor.—We are taught that cohesive or annealed gold is really softer than any other, and that though it may seem harder and harsher, it is made so by the instrument, the explanation being that the molecules being more cohesive, slip by one another less readily and so offer more resistance to alteration of shape or position. Now will you please tell me in what particular this differs from the property that produces hardness in any other substance, physically I mean, of course. Is it not this same cohesion of molecules and their resistance to displacement, which makes iron or ice hard? If it is this same cohesion of particles that makes iron harder to break or bend or compress than dough, this holding on of molecules that will not allow them to slip by, away from, or on to one another; how is it that it makes one thing hard and another soft? If it is meant that the individual molecule is softer, I have nothing to say about it, till some of our smart brethren devise a plan by which we can get hold of these uncertain little individuals so as to allow us to pack them into a cavity, one by one, and thus utilize their softness. Until then, as we will have to deal with them in the aggregate, and if as such they work stiffer and less yielding, would it not be as well to call such gold hard for the sake of simplicity?

Very respectfully,
J. W. F.

Perhaps, if we would for convenience sake call annealed gold adjustable foil, and the variety known as cohesive foil unadjustable, these would satisfy us just as well as any other terms. All pure gold with clean surfaces is cohesive; any which is non-cohesive is such because of slight alloying, or because of surface contamination. The alloy may be so slight as not to interfere with its purity practically.

It is understood, we believe, that Abbey's old-fashioned soft foil, than which there is none better, is alloyed with a trace of iron. Condensation of gases on the surface of foil interferes with its cohesiveness, many metals having the property of condensing gases on their surfaces,—possibly indeed a penetration of the gases into inter-molecular spaces. It may be worth while for our correspondent to keep in mind the fact that the most careful cleansing does not seem to make some of our purest metals, as platinum for example, cohesive, except at a white heat. We can only take the facts as they are, and sometimes act without explanation of them. Ice only coheres, we believe, by previous melting of the surfaces in contact. There is no explanation of why osmium for instance is infusible, or why iridium is so hard in its normal state; or why gold is soft, or tin easily fused. These are ultimate facts. Cohesive, or pure annealed foil *is softer* than that which is unannealed, just as truly as annealed gold plate is softer than that which has been hammered. But our dental nomenclature is yet new and as a consequence not exact. It is only a few years since cohesive foil was called *adhesive*. To come back to where we started, the old fashioned foil of Abbey's manufacture was eminently adjustable in the cavity, and so filled a place which the average operator finds it difficult to supply with other foils. The mallet is a good thing doubtless, but not the only good thing in dentistry; and evidently from the written and spoken opinions of many of the strictly cohesive foil operators, they have not the slightest idea of the capabilities of non-cohesive foil, or perhaps never saw an operation from a first class dentist in that style of work.

H.

The Texas State Dental Association.

The annual meeting of this Association will be held in Austin on May 4th, 1881. The profession generally are respectfully invited to be present, as a very interesting meeting is anticipated.

W. R. Clifton,
Rec. Secretary.

EDITORIAL, ETC.

The Forty-first Annual Commencement of the Baltimore College of Dental Surgery was held March 2nd, 1881, at 2 P. M. at the Academy of Music, Baltimore City. A large and brilliant audience filled the spacious auditorium, and everything passed off successfully and pleasantly. The Fifth Regiment Band, Director Itzel, furnished enlivening music. After prayer by the Rev. William Kirkus, D. D., Rector of St. Michael and all Angels' Church, the names of the graduates were announced and the degree of "Doctor of Dental Surgery" conferred by Prof. F. J. S. Gorgas, Dean, on the following gentlemen:

Samuel B. Adair,	*Georgia.*
Roderick Ashton Barrick,	*Maryland.*
Ellis B. Bliss,	*Dist. Columbia.*
Ludwig Brandt,	*Germany.*
Benijah S. Byrnes,	*Mississippi.*
James Valentine Calver,	*Dist. Columbia.*
George White Carmen,	*New Jersey.*
Myron A. Carman,	*New York.*
Leonard T. Caughy,	*Maryland.*
Thomas E. Craddock,	*Virginia.*
Robert Byron Cummins,	*Pennsylvania.*

Edward R. De Normandie,	*Pennsylvania.*
Benjamin Hale Douglass,	*Massachusetts.*
Byrd Page Dunnavant,	*Virginia.*
Frank O. Eilenberger,	*Illinois.*
Charles Marshall Emmart,	*Maryland.*
Benjamin Flannigain,	*Maryland.*
William G. Foster,	*Maryland*
Theodorick Thomas Frazier,	*North Carolina.*
Laurence De Lancy Gorgas,	*Maryland.*
James H. Grant,	*Texas.*
Charles Church Harris,	*Maryland.*
Howard William Hoopes,	*Maryland.*
James A. Hurdle,	*North Carolina.*
John G. Keller,	*Georgia.*
Daniel O. Knight,	*Dist. Columbia.*
Henry D. Kurtz,	*New York.*
Frank Adolph Lee,	*Virginia.*
Myron M. Maine,	*Connecticut.*
Lemuel Estes Meador,	*South Carolina.*
Frank S. Milbury,	*New Brunswick.*
Robert W. Morgan,	*Virginia.*
Edgar P. Parsons,	*West Virginia.*
H. Spencer Pitts,	*Virginia.*
Edgar R. Rust,	*Virginia.*
P. Henry Salles,	*Louisiana.*
Frank Morris Seebold,	*Pennsylvania.*
James J. Seigler,	*South Carolina.*
Damian Silva,	*Cuba.*
B. Holly Smith, Jr.,	*Maryland.*
Edwin Byron Smith,	*Pennsylvania.*
Frank Alexander Speck,	*Tennessee.*
Charles Lowndes Steel,	*Virginia.*
Robert Wilson Sterling,	*South Africa.*
Caleb Anderson Thompson,	*Virginia.*
Wesley Fletcher Tigner,	*Georgia.*
William Townes, Jr.	*Virginia.*
John Charles Wachter,	*Maryland.*
Effingham Wagner,	*Alabama.*
John Henry Walker,	*Louisiana.*
William Austin White,	*New York.*
W. Cuttino Wilbur,	*South Carolina.*
E. Powell Wright,	*Virginia.*

Many floral offerings, costly, beautiful and unique in design were presented to the graduates by their lady friends, who composed a large part of the audience.

The Valedictory Address was then delivered by the Rev. William Kirkus, D. D., in the able and attractive manner so characteristic of this well known and highly esteemed clergyman; and which we present to our readers in the present number of the Journal.

The presentation of the Collegiate Prizes was then made by Dr. M. W. Foster, President of the Board of Visitors, as follows:

The First Prize —A Case of Dental Instruments, to Laurence De Lancy Gorgas, of Maryland, for the highest number of votes at the final examinations on all the branches taught in the College. Honorable mention was made of Charles Lowndes Steel, of Virginia.

The Second Prize—A Set of Forceps, from Messrs Snowden and Cowman, of the well known Baltimore Dental Depot, to Myron M. Maine, of Connecticut, for the best operation of filling teeth before a Committee of the Board of Visitors. Honorable mention was made of Edgar R. Rust, of Virginia.

The Third Prize—A Dental Engine from S. S. White, Philadelphia, to William G. Foster,of Maryland, for the best piece of plate work presented to a Committee of the Board of Visitors for examination. Honorable mention was made of Benjamin H. Douglass, of Massachusetts, Benjamin Flannigain, of Maryland, Frank M. Seebold, of Pennsylvania, James V. Calver, of District of Columbia, Edward R. De Normandie, of Pennsylvania and Edwin B. Smith, of Pennsylvania.

The Fourth Prize—A Set of Varney Pluggers, from S. S. White, Philadelphia, to Frank Morris Seebold, of Pennsylvania, for the best essay on, and specimen of, Pivot Teeth, presented for examination to a Committee of the Board of Visitors. Honorabla mention was made of Effingham Wagner, of Alabama.

The Class Valedictory was delivered by B. Holly Smith, Jr. of Maryland, the composition and delivery of which were in the highest degree creditable to the orator, being considerably above the average standard of such addresses.

At the annual meeting of the Alumni Association which was held during the morning of Commencement day, the following officers were elected for the ensuing year; President: Dr. F. J. S. Gorgas, of Maryland; 1st, Vice President: Dr. L. M. Cowardin, of Virginia; 2nd Vice President: Dr. B. M. Wilkerson, of Maryland; Treasurer: Dr. T. S. Latimer, of Maryland; Corresponding Secretary: Dr. Thomas E. Craddock, of Virginia; Recording Secretary: Dr. Walter S. Harbin, of District of Columbia. The Alumni Banquet was held at the Eutaw House on Commencement evening. Dr. F. J. S. Gorgas presided. The toasts were: "The Dental Profession of America," responded to by Dr. F. N. Seabury, Rhode Island. "The Dental Profession of Europe," responded to by Dr. Ludwig Brandt, of Germany. "The Medical Profession," responded to by Prof. T. S. Latimer, M. D. of Maryland. "The Baltimore College of Dental Surgery," responded to by Prof. J. B. Hodgkin, of District of Columbia. "The Alumni of the Baltimore College of Dental Surgery," responded to by Dr. J. Ryerson Smith, of South Carolina. "The Board of Visitors of the Baltimore College of Dental Surgery," responded to by Dr. Wm. Farmer, of Virginia. "The Graduating Class of 1881," responded to by Dr. B. Holly Smith, of Maryland. "Artistic Dentistry," responded to by Dr. Coryden Palmer, of New York. "The Dental Profession of the South," responded to by Dr. W. F. Tigner, of Georgia. "The Dental Profession of the North," responded to by Dr. F. A. Levy, of New Jersy. "The Dental Profession of Baltimore City," responded to by Dr. George W. Massamore, of Maryland. "Dental Education," responded to by Prof. R. B. Winder, of Maryland. "Session 1880–81," responded to by Dr. T. E. Craddock, of Virginia. "The Junior Class of 1880-81," responded to by Mr. J. B. Harris, of Virginia. "Dental Inventions," responded to by Dr. B. M. Wilkerson, of Maryland. "Dental Literature," responded to by Prof. F. J. S. Gorgas, of Maryland. The Committee of Arrangements were Drs. C. E. Duck, George W. Massamore and William A. Mills. The banquet was served in excellent style, and every thing passed off very pleasantly.

The Session of the Baltimore College of Dental Surgery just terminated, marks an era in this, relatively speaking, venerable institution. The time was in the not remote past when the friends of the old College felt a shade of sadness at the slim attendance on the lectures as contrasted with newer, and more prosperous schools further North; and the shade deepened into gloom as the fact was recognized that the South, from which most of the students came, was growing poorer year by year. But that is all past, and with the return of prosperity to the southern community came students flocking from not only the South, but from all quarters; and the class of the past session rolls up almost one hundred names, and fifty-three graduates! Those who have taught these students testify that their average ability is quite equal, if not superior to that of any class in the past. We feel that a larger proportion of really good operators have gone out from the classes of the past few years than ever before; and that more men who will contend for a high professional standing are now educated than at any time in the past. One gratifying fact presents itself,—most of the young men who come to us are better educated in such instruction as will help them in their studies at the college than in previous years. It is to be hoped that in the future no dentist will encourage a student to attend a dental college before he is as well trained mentally as though he expected to enter a law office, or a literary institution for an academic degree. Let this be brought about and a great revolution will have been made in dental education. We have said so often in these pages, that one of the most embarrassing obstacles in the way of teaching a specialty is lack of general training, that it may seem a trite remark. Yet we repeat it. Let the young men be liberally trained, at least so far as good common schooling is concerned, and the professorial labors will be enormously lightened. There are men who enter dental colleges and coolly announce their intention to graduate on their manual dexterity, cleverness of manipulation, &c. Let it be understood that mental training is made a large part of the course of instruction because it is in this that our students are largely wanting, and surely those who prepare them for us will see to it that they are informed in this direction. H.

The Publishers of this Journal, and the editors, have jogged along now for a good many years quietly and steadily, without jar or collision of importance. They have never asked of the latter at any time editorial comment or commendation. Yet they deserve it. They have kept in Baltimore a Dental Depot, well supplying the wants of the profession in the South and quite largely in other parts of the country, and have been ever and always prompt, accomodating and reliable. We think all who have dealt with them will testify to this. They have been manufacturers, too, and some of the best things in use in the way of laboratory equipments, lathes, etc., have been invented and manufactured by them; but so quietly and with so little parade that it has passed partly unnoticed. Few know, perhaps. that the distinctive features of one of the newest and most popular dental chairs now sold, emanated from this house; and they made for years one of the best and most popular chairs ever devised, and one which is still largely used. So we feel, (although they do not ask for it,) like saying a good word for them, and acknowledging their services in the past and present in keeping up a Dental Journal in Baltimore at no profit to themselves.

H.

BIBLIOGRAPHICAL.

Journals.—

Volume II of the *Independent Practitioner* comes to hand, thus entering on the second year of its existence. This is a Baltimore enterprise, and is spicily edited by Harvey L. Byrd, A. M., M. D., and Basil M. Wilkerson, D. D. S., M. D., at 68 North Charles Street,—price $2.00 per annum. The theory on which the *Practitioner* is published is, that it shall be an organ of both the medical and dental professions. The number before us, for February, seems entirely devoted to medical science, as we do not notice any papers on dentistry. Our profession at large read little enough of medicine we suspect, and so it may be just as well to give them a chance of finding medical papers in a semi dental journal. The editors have a good deal of enterprise to start a new journal amidst the multitude of quarterlies, monthlies, bi-weeklies, with a threat of a daily sometimes, and the fact that they continue it into the second year is, we suppose, proof that it has life and aim. The editors claim that it "has the largest circulation of any medical periodical this side of Philadelphia," a claim which if correct, is certainly a remarkable success, provided this is a cash and not credit circulation.

H.

MONTHLY SUMMARY.

A Curious Fracture of Skull and Face.—Dr. Palmer gave a verbal description of the Burr Robbins case as follows: Mr. Robbins's injuries were received Jan. 17, 1880, by coming into collision with a bridge while standing upon a small steamboat which was moving very rapidly. His head was caught between the timbers of the bridge and the flange of the boiler, which was an upright one. The bones of the skull were crushed in; the frontal bone was separated along the course of the sutures, longitudinally and transversely, and raised out in front as far as the tissues would permit; without being torn they were put upon the stretch so that the bone could be raised and lowered like the lid of a box over a space of about two inches. The temporal bone was depressed—crushed in, about an inch and a half back of the eye, and the bone forming the upper part of the orbit of both eyes crushed into fragments, as were also the nasal bone on one side. The bones on the opposite side were adjusted as accurately as possible. There was a fracture of the malar bone extending down toward the throat, and the upper jaw was broken loose, and knocked over toward the left side about one-quarter of an inch, so that the whole jaw might be moved to and fro laterally to that extent. There was also a fracture at the back of the head and a scalp wound of about three and one-half inches in extent. The amount of bone removed was about three and one-half square inches in area. The brain was lifted out of its resting place about half an inch, and one of the internal temporal arteries was torn across. Of course, it seemed as though such injuries must prove fatal almost instantly. Although the patient was a man of remarkable vitality and power, he was at the point of dying about half an hour after the accident. The marked peculiarity of the case was the retention of consciousness by the sufferer. While his wounds were being dressed he gave directions about his business, made his will, and adjusted all his affairs as if nothing were the matter. The only loss of consciousness occurred while a sponge wet with cold water was applied to the surface of the brain. When the pressure was made he would cease talking, and the instant it was removed he would resume at the point where he left off. He has suffered more from the injury to the upper jaw than from the damage to the brain. At present he can use either eye separately, but there is a loss of co-ordinating power which prevents the use of both together. He is in very good physical condition and fair mental power; says that he can attend to his business and give general directions, but tires quickly.

Dr. Vivian also gave details of an interesting case in which the skull of a child had been crushed in by the kick of a horse, and in which there was no loss of consciousness at any time except when under the influence of chloroform for the removal of the bone.—*Med. Record.*

Tharapeutical Effects of Chlorate of Potash.—Two monographs on this subject from Dr. Harkin's pen have already appeared. The first, entitled, "The use of Chlorate of Potash in the Treatment of Consumption and Scrofula," will be found in the *Dublin Quarterly Journal of Medical Science* for November, 1871; the second, "On Chlorate of Potash in the Hæmorrhage Diathesis," was read before the British Medical Association, at its meeting in Cork. in August, 1877. Dr. Harkin, (*Dub. Med. Jour.*, May 1880.) as the result of observations extending over many years, considers that chlorate of potash exercises a most potent influence on all maladies dependent on defective nutrition and molecular metamorphosis; that it possesses the power of developing vital force in weakened constitutions, of retarding the degeneration of the tissues, and of controling the too rapid advance of senility due to climatic condition. After its continued employment, the patient experiences an increase of appetite, and of nervo-muscular force; all the bodily functions are performed with greater ease, the color improves, and the flesh-producing power, as shown by increase of weight, is augmented. For internal administration, it is ordered in solution—an ounce of salt to twenty of water, and of this two tablespoonfuls should be given three times a day, either before or after meals. It has been prescribed for thousands of patients, with wonderful success, and rarely, if ever, disagrees. In one instance, a young man took by mistake an ounce of the salt at a dose, without experiencing any unpleasant symptoms. In the form of a lotion—five grains to the ounce—it is a valuable application to burns and scalds, the healing process proceeding more rapidly than under other modes of treatment. In caries of the vertebræ, and in strumous abscesses and sinuses, its beneficial effects are very remarkable. As an application to ulcers—simple, irritable, indolent and rodent—it would be difficult to overestimate its value. The hard and elevated edges of old ulcers give way to flattened and healthy ones, and the excavated surface of the sore is altered by the oxygenating power of the lotion, and replaced by healthy granulations.—*The London Medical Record.*

Adulterations in a New Sugar.—The manufacture of a new kind of sugar by a secret process has excited much attention again to the question of the adulterations of this article. The City Board of Health is now engaged in examining various kinds and grades of sugars for the purpose of obtaining exact knowledge on the subject, and it will doubtless furnish facts that will be decisive as to how much harmful adulteration there really is. Meanwhile, there is a good deal of talk and protest concerning the deceitfulness of the so-called "new process sugar." This sugar is made by mixing very carefully refined grape-sugar with various grades of ordinary cane-sugar. As the grape-sugar is perfectly white, it of course gives a finer appearance to the dark sugars with which it is mixed, and, as it costs only four or five cents a pound, considerable profit can be made. The grape-sugar is made out of corn, sulphuric acid being used in the process. As prepared by the "new process," it is white, dry, very finely grained, and not so sweet as cane-sugar. The only objection that can be made against it is that sulphuric acid and gypsum are liable to become mixed with it in its manufacture. Such adulteration, however, if it exists, is in too small amount to be of any harm. The same may be said of the alleged adulterations of other sugars. It is very doubtful if the Board of Health finds anything to alarm housekeepers as the result of their investigations.—*Med. Record.*

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ARTICLE I.

Proceedings of the Maryland and District of Columbia Dental Association.—Annual Meeting.—(CONTINUED.)

THIRD DAY, *Morning Session.*

The President called the Association to order at 11 o'clock. The minutes of the previous meeting were read and approved.

Dr. Noble proposed the name of Dr. R. B. Winder, Jr., of Baltimore, as a member of the Association, who was unanimously elected.

On motion of Dr. Hunt, the name of Dr. H. F. Smithe was transferred from the roll of Active to Honorary membership.

The committee to whom was referred the President's Address, made the following report:

The special Committee, to whom the President's address was referred, respectfully recommend that all that portion of it treating of the relation of Dental Societies and Associations to Dental Colleges, be referred to the Section on Dental Education and Literature for a report thereon at our next annual meeting.

. The Committee further recommend that the suggestion of the President with referrence to a Mass meeting, be carried into effect, and submit the following resolutions:

Resolved, That a Mass meeting of the Dentists of Maryland be called to be held in Baltimore on the second day of the next annual meeting of this Association.

Resolved, That in the meantimet he State of Maryland be thoroughly canvassed in order to secure the co-operation of the members of the Profession of Maryland in procuring the passage of a Dental law and their attendance at this Mass meeting.

Resolved, That a committee of three be appointed with instructions and powers to carry into effect the foregoing resolutions.

R. Finley Hunt,
T. W. Coyle,
W. C. Thompson.

On motion the report was adopted.

Dr. Winder moved that the President of this Association be relieved from his duties as Ex-officio Chairman, being a member of this Committee. Adopted.

The Publication Committee reported as follows, which report was adopted:

The Publication Committee have to report that arrangements have been made through the kindness of Prof. Gorgas, with Messrs. Snowden and Cowman, of Baltimore, Maryland, to print the proceedings of this Association, which promise they satisfactorily performed without charge for the last meeting.

H. M. Schooley, *Ch'n ex-officio.*
J. B. Hodgkin.

Dr. Waters moved a vote of thanks be tendered these gentlemen for their kindness in printing these proceedings. So ordered.

On motion, the Secretary was requested to notify Prof. Gorgas and Messrs. Snowden and Cowman of the action taken by the Association.

The Secretary was also directed to tender a vote of thanks by letter to the Hon. Wm. A. Fisher for the kind interest he displayed in trying to get a bill passed for the better protection of Dentists through the Legislature of Maryland. Also to Mr. W. N. Smith.

Dr. Hunt made a statement about the bill that was laid before Congress for the protection of Dentists in the District of Columbia. He also made mention of the National Association that was formed in New York last summer.

Dr. Winder said he thought it necessary to remind the members of this Association that it is possible at least, that at the coming session of Congress an application may be made for an extension of the Cummings patent, and moved that the committee appointed at the last meeting to watch the proceedings of Congress and report if such attempt should be made, be continued. Adopted.

Dr. Thompson read the following paper by Dr. Laurence Turnbull, of Philadelphia:

Hydrobromic Ether or Bromide of Ethyl as an Anæsthetic.

The hydrobromic ether or bromide of ether was discovered by Serullas in 1827, but received no special attention until Dr. Thomas Nunnelly, of Leeds, made some experiments with it on animals in 1849. Dr. Nunnelly brought the subject again before the profession, by a paper at the meeting of the British Medical Association in 1865, in which, in conjunction with another anæsthetic, he says he had employed the one or the other in all the principal operations at the Leed's General Eye and Ear Infirmary. This was at the time when chloroform held such complete sway in England, that no importance was attached to Nunnelly's experience or experiments, and he had no one to follow him in using it, and we hear no more of it until 1876, when some experiments were made with it in France, by Rabuteau, on the lower animals, but evidently without a knowledge of the fact that this had been done previously in England by Nunnelly.

I then took the agent up without the knowledge of the experiments of Dr. Nunnelly, of England, and had it made in Philadelphia by Professor Remington, and with two friends began experimenting in September, 1877, using it first on myself, and then upon my patients. After satisfying myself as to its efficiency and safety as an anæsthetic, I laid the subject before the Pennsylvania State Medical Society in 1878, and a record of ten cases, with my conclusions, which were published in the volume of their Transactions for that year. In August, 1878, I brought it before the British Medical Association at Cork, and in September of the same year, I presented a report of one hundred cases before the International Medical Congress at Amsterdam (to which I was a delegate from the American Medical Association,) up to March, 1879, when the second addition of my work on anæsthetics went to press. I had published a report of twenty-five successful cases in quite a variety of surgical operations, and had not only employed it at my daily ear clinic, but also in the Jefferson Medical College Hospital, and administered it in April, 1879, to a patient of Dr. Samuel W. Gross, at the public clinic, when he (Dr. Gross) removed a hyoid cist in front of the neck of a child. Dr. R. J. Levis, who was at this clinic, for the first time saw it employed, and became much interested in its use.

I thus compelled chemists to make it, by producing a demand for it, and gave them, through Dr. Green, a good formula free from phosphorous; I interested surgeons all over the country to try it, and especially the surgeons of this city, by bringing it in every way before their attention. Subsequently the whole number of cases in which it has been employed by myself and friends up to the present time, June, 1880, will number eight or nine hundred.

I cannot but feel disappointed that two deaths, not produced by it, should have been associated with it,* as such accidents will be employed by those having a prejudice against the ether, to condemn it on theoretical grounds. It is my firm conviction that although in several instances recently the use of this anæsthetic has been attended with persistent vomiting, in the hundreds of cases in which it has been employed, chiefly in Philadelphia, in not one single instance has it caused cerebral trouble, or any of the symptoms produced by the action of free bromine, which are as follows. When dogs are confined in an atmosphere of bromine vapor, they suffer a profuse secretion from the eyes, nostrils and fauces, with cough, hoarseness, dyspnœa. I have experimented upon frogs, cats, dogs rabbits, and various other animals by subjecting them to an atmosphere highly charged with the vapor of hydrobromic ether, and in no instance was there the slightest irritative effects as described above.

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* The bromide of ethyl as an anæsthetic, by Marion Sims, M. D., LL. D., New York Medical Record, April 3, 1880.

PHILADELPHIA, June 2, 1880.

"Deputy Coroner Beam made an investigation of the circumstances, as reported in *The Times* nearly a week ago, of the death of William Linderman, eighteen years old, of Schuylkill county, while upon the operating table at the Jefferson College Hospital on Wednesday last, under the influence of the new anæsthetic, bromide of ethyl, and about to be treated for stone in the bladder. He had been about sixteen weeks under the care of Dr. R. J. Levis, one of the strongest advocates of the new anæsthetic, and was taken to the hospital by his direction. Linderman's health was very poor at the time. Dr. Ames, who applied the bromide, said no incision had yet been made, but Dr. John B. Roberts said it had. The patient was in such a condition that something had to be done, because he could not survive the hot weather; 96° 98° in the shade.

Dr. J. G. Lee, the Coroner's physician, testified that he found the brain congested, *the lungs far advanced in consumption, and the kidneys and liver enlarged* and two large encysted stones in the bladder. His opinion was that they could not have been safely taken out. *Linder-*

man could not have lived over a week or two at any rate. Dr. Lee said further, that he had experimented with the bromide on animals without bad results. In his opinion death resulted from exhaustion and prostration, the result of phthisis. The jury took the same view in their verdict."

In subjecting the new anæsthetic to this most severe test we do not think our friend Dr. Levis was doing justice to it; knowing the extreme debility of the patient, and that the most simple nervous shock would render him liable to death. Hundreds of patients have thus died. Again, when ordinary ether, chloroform, or other anæsthetics cause fainting, which was no doubt the result in this case, artificial respiration has to be resorted to; now we were reliably informed that when this useful means was resorted to by alternating and relaxing the chest walls, *the pus which was in this man's lungs was forced into his bronchial tubes and suffocated him.*

In some recent experiments on animals I crowded four ounces (the quantity stated to have been used by Dr. Sims) upon a dog for several minutes, by means of a tin inhaler, until he became apparently dead, with no perceptible action of the heart or lungs, but his expression of eye was clear, and the pupil was dilated, while there was no secretion from the eyes or nostrils. The apparatus was removed in the space of four minutes, and he was exposed to the air when at once he began to breathe, and at the end of the six minutes, he had almost entirely recovered consciousness.

The dog did not seem much inclined to move for ten or twelve minutes afterwards. While this dog was only partly under the influence of this anæsthetic, having at first caught the inhaling apparatus with his under teeth; there was a great deal of rigidity, and slight tetanic movements of the extremities but this was overcome by the free use of the ether. Now, had we been using chloroform, just before we would have been ready to perform any experiments upon the animal, he would have been dead, and no removal of the anæsthetic nor the introduction of atmospheric air, would have been of any avail. Again if Squibb's rectified, and absolute ether had been employed; we must have super-saturated the animal, and been annoyed by the expectoration of large quantities of mucus. Then we frequently have seen tetanic convulsions, requiring several assistants to hold the patient, with great reduction of temperature, from the use of ordinary ether. The rapidity of the anæsthetic action of hydrobromic ether and its rapid elimination from the system by the lungs, are two of its chief merits for all operations that are not prolonged. If an operation is to be very tedious, and requires from one to two hours, we would advise the additional use of purified sulphuric ether to the anæsthetic. *We would therefore recommend pure hydrobromic ether in operations not lasting over forty minutes.* There is one great advantage in the use of this agent, that the administrator must attend to the anæsthetic all the time, he cannot watch the operation and forget the patient for a few seconds; his whole attention must be given to keep up its action. We have often felt sure that the wet napkin, from the water, in the ordinary ether pressed over the patients mouth by the weight of the body of the persons giving the ether, and watching the operation, were the indirect causes of the death of the patient. Within the last few days we have employed it in labor for the second time; and it has peculiar advantages in that it is so rapid in its effects, and the patient is comforted between the pains, but never passes into such a state of profound anæsthesia, that she is aroused by the expulsive effort, and has all her consciousness about her, and none of the depressing efforts of ether or chloroform. It is also most valuable in these cases in changing the position of the child, also in bringing forward the neck of the uterus into its proper position. In neither of these instances was there disturbance of the bowels, pain in the back or head. To the country practitioner who has to extract teeth or perform all the minor operations in surgery it is a great boon, as it acts like nitrous oxide gas; it is well where a number of teeth are to be extracted, that a prop of hard wood attached to a string should be used, so as to prevent such an accident as once occurred in Philadelphia under the use of nitrous oxide gas, as of the swallowing of a prop of cork. In many cases where you do not want a very profound narcotism with hydrobromic ether, the muscles of the patient become rigidly contracted. This condition occurred in a recent occasion, when we administered (℥ i) of this anæsthetic and the operator's finger was caught and pinched, as also his forceps, and yet before operating we could touch the cornea with impunity. Although the impression passed away very rapidly, we extracted twelve teeth with entire success, the patient promptly recovering consciousness, and not feeling the pain. In the following case the patient went under it very kindly. This patient was a man of very nervous temperament. With three drachms of the hydrobromic ether anæsthetic was produced without any struggling, and in four minutes from the time he had commenced to inhale it, the dentist had extracted ten teeth, and he had fully recovered consciousness, although he had just eaten a heavy breakfast of solid food. There was no neusea in either of those cases.

In a recent case of cataract extraction the patient went beautifully under the influence of the anæsthetic, extraction was accomplished, and the patient recovered so as to be able to count fingers, yet owing to some strong coffee which he drank; from dyspeptic symptoms or the swallowing of water soon after the operation, she became very sick at her stomach, and vomited for nearly twenty-four hours, and yet the case did well. In a case of operation for torticolis in a woman, she swallowed so much air with the ether, that as a consequence she complained of pain, of a hysterical character, in lower part of the abdomen, the same which is often the result of nitrous oxide gas inhaled, and too much air admitted.

A few days ago we received a letter from Dr. J. Patterson Cassells, of Glasgow, a distinguished Aurist and a Surgeon to a celebrated Glasgow Infirmary; he writes: that he has used a specimen of the hydrobromic ether, which I gave him at Cork, as vapor, in diseases of the middle ear, and have also employed it as an anæsthetic with success.

Discussion being in order, Dr. Winder said: Mr. President, I wish to say that I have seen this agent administered in quite a number of cases. It acts very rapidly and its effects pass off as rapidly. When first given to us it was claimed to produce no nausea. That is a mistake. It has been used by one or two of the first surgeons of Baltimore, and I have heard from one of them that he is not much pleased with it from actual experiment. I have used it myself in three or four cases. It produces sufficient anæsthesia, but acts rapidly and passes off as rapidly. I could not pronounce it free from danger. All these agents are dangerous. Normal respiration is absolutely necessary to continue life. In producing anæsthesia you have brought on asphyxia. I think there is no anæsthetic known that will support life. Many of them are very dangerous and the experience of numbers of our profession, added to the revelations of the spectroscope, pronounce nitrous oxide gas the most so of all. While I use them there is no man more wary or more afraid of anæsthetics. I do not consider any of them safe, nor I do not think it necessary to absolve this new anæsthetic from the category of others known to be unsafe.

Dr. Atkinson.—The responsibility of having opinions at all that are to be pronounced for other men's minds to take cognizance of, renders it impossible for me to keep still when this subject is up for discussion. All you who understand my views on anæsthetics in general and in particular know that I am opposed to them "in toto"; and that the only advisable anæsthetic to be exercised upon a human being except in the rarest cases is that of a kind heart and clear head guiding the hand in performing operations upon the body. I have never thought them safe in hospital or private practice. Many cases have I seen where they were recorded in the Colton Dental Association as successes where the persons had been persuaded to sign their names to that certificate before they had complete use of their senses. I am so much in earnest about this thing that if it was in my power I would wipe them from the face of the earth.

Dr. Webb.—I certainly coincide with Dr. Atkinson in all he has said in regard to anæsthetics. I want to say that I stand before you to-day with weak lungs, and these lungs are weak from the use of nitrous oxide gas. Now then I would say that I earnestly believe that it would have been better for dentists and for the people if artificial teeth had never been devised. For so many would not have been prompted to rip out the teeth—these priceless pearls,—and put in an inartistic row of tombstones. Men who extract teeth knowing they should be saved, do something for which they should be put in prison; in many cases should be hung for such things.

Dr. Atkinson.—Opium is an anæsthetic that is claimed to be a boon. I think it one of the greatest curses that ever came from the east or the west. I have had patients that had acquired a habit of taking it just from having it prescribed at some time for the relief of some pain.

Dr. Winder.—The subject we are discussing is anæsthesia, not narcotics. I will agree with Dr. Atkinson and Dr. Webb in all that they have said here regarding the improper removal of teeth. It is simply outrageous malpractice. We must not arraign the anæsthetic in associations with this butchery and put the abuse upon it. It is the *improper use* of an agent that should condemn it, not the *use* for which it was made. You may take whiskey and it is the *abuse*, not the *proper use*, that condemns it. To condemn it entirely except in such abuse, would be to my mind radically wrong. I think one man's whole attention should be given to the administration of the anæsthetic and have some one else to do the extracting or other operating. I think anæsthetics are given to us by the Creator, to use, and I think it wrong in the gentlemen to condemn them in toto.

Dr. Webb.—In some major operations anæsthetics may be used with good results. If there be a chance between the patient dying under the operation and living if an anæsthetic be administered then give it, but in no minor surgical operation should it be given. I said that so far as the dentist is concerned it would have been better if the anæsthetic had not been discovered. It does lead patients to this ripping out of the natural teeth, operations they would not have had performed without these agents.

The subject of anæsthesia was passed.

The Executive Committee made the following report, which was adopted:

WASHINGTON, OCT. 29, 1880.

The Executive Committee respectfully report that they have discharged the duties imposed upon them by the Constitution, to the best of their ability.

Invitations to attend the present meeting were sent to many prominent members of the profession outside the bounds of the association, some of whom we have had the pleasure of welcoming among us.

The admirable and instructive clinics given by Drs. M. H. Webb, of Lancaster, Pennsylvania, R. R. Underwood, of West Chester, Pennsylvania, J. L. Baker, of Coatsville, Pennsylvania, and George F. Reese, of Brooklyn, New York, have been most highly appreciated by the members of the Association generally, and have added great additional interest to our meetings. The thanks of the Association are due to these gentlemen for the sacrifice of time and money they made in order to be with us and lend their valuable aid in carrying out the objects of our Association.

There have been no dental appliances presented for examination and report by your Committee.

In regard to special matter of reporting a time for the annual meeting of the Association, which was referred to the Executive Committee, they have to report: that after a full consideration of the subject, they are forced to the belief that there is no particular season of the year which could be selected for our meetings, that would prove convenient for *all* the members: but so far as the committee are able to judge, a majority of them would find it less inconvenient to leave their offices, for a few days, immediately after the usual summer holiday—say about the first week in September. The committee would therefore recommend that the first Wednesday in September, 1881, be selected as the time for holding the next meeting of the Association.

The treasurer's report, which has been examined and found correct—shows that there was a balance of	$4.40
in his hands at the commencement of the present year. Received since for dues and assessments	$78.00
Making a total of	$82.40

now in the hands of the Treasurer.

The expenses of the present session of the Association which have been examined and approved by the Committee amount in the aggregate to	$47.35
In addition to this amount there is due by the Association a balance fee for printing the proceedings of 1878, amounting to	$43.80
And also the bills for expenses in the effort to obtain Legislation in regard to the practice of Dentistry in the State of Maryland, which were presented by Professor Winder, amounting to	$22.18
Which makes a total indebtedness of	$113.33

It will be seen that this leaves a balance of indebtedness of $30.93 in excess of the amount now in the hands of the Treasurer, which it will be necessary for the Association to provide for.

All of which is respectfully submitted.

R. B. Donaldson,
J. L. Wolf,
Committee.

Dr. Donaldson suggested that some arrangement to pay the expenses of the meeting be made.

The members present contributed to make up the necessary sum to relieve the Association of debt.

The rules were suspended and Drs. R. P. Fletcher and Hall Lewis, of Washington, were unanimously elected members.

On motion, the secretary was authorized to subscribe to the "American Journal of Dental Science" in the name of the society.

The society then proceeded to elect officers for the ensuing year, and Drs. Hunt and Winder were appointed tellers to conduct the same.

The election resulted as follows:

President, Dr. H. B. Noble, of Washington.
Vice President, Dr. T. S. Waters, of Baltimore.
Cor. Secretary, Dr. H. M. Schooley, of Washington.
Rep. " Dr. J. C. Smithe, of Washington.
Treasurer, Dr. J. B. Ten Eyck, of Washington.

Drs. R. B. Winder, T. W. Coyle and H. C. Thompson were appointed as Executive Committee.

The retiring President upon leaving the chair, said:

"*Gentlemen.*—I cannot leave you without an expression of opinion as to your uniform kindness and courtesy toward me in my official capacity; you have certainly made my duties by your kind assistance, sit as lightly as is possible, and thanks very cordially.

To those gentlemen who have favored us with their presence we are greatly indebted, and I but express the individual and collective opinion of the Association when I thank them very heartily for the papers they have presented; and for their clinical operations. This Association is not sectional, it reaches to all parts of our country, and all parts of the world for truths; and whoever presents an article for consideration presents it to unbiased minds, who receive it on its relative merits alone. There is, to borrow an expression from our esteemed friend Dr. Atkinson, (and I wish I could borrow a car load of condensed articulated sayings of his) "a togetherness in this Association that is apparent to all, the apartness," if any, is scarcely discernible. I now ask of you the same kindness to my successors as you have shown to me."

Drs. Hunt and Evans were appointed to conduct the newly elected President to the chair. Upon being introduced Dr. Noble said:

"*Gentlemen.*—I appreciate this honor, and feel I trust duly thankful for the honor of being elected as your presiding officer for the ensuing year. This is no time or occasion for making an address, only to thank you and ask you to overlook any failures I may make, promising to do the best in my power for the interest of the Association."

Dr. Waters upon being introduced said: "I thank you for this honor and promise to support our President to the best of my ability."

Drs. Smith and Ten Eyck each thanked the Association and promised to do the best in their power for it.

Dr. Winder moved a vote of thanks for Dr. T. W. Coyle the retiring Treasurer. Dr. Coyle thanked the Association for the compliment.

A vote of thanks was extended Dr. John Lanahan for clerical services.

The President appointed on the publication committee Prof. Gorgas, Drs. Hunt and Hodgkin. Dr. Schooley chairman *ex-officio.*

On motion of Dr. Winder a vote of thanks was extended the proprietor of the hotel, and the mover of the resolution was on motion of Dr. Hunt directed to convey the information.

On motion of Dr. Donaldson the Association adjourned *sine die.*

ARTICLE II.

The Philadelphia Bogus Diplomas.

The confession of Buchanan, as published in the Philadelphia *Record*, announces the startling fact that no less than 60,000 bogus diplomas have been issued. It is gratifying to state that the diploma of the Baltimore College of Dental Surgery has never been sold or counterfeited. The confession is as follows:

"When Buchanan was entrapped, and the trick of his alleged drowning was completely exposed by his arrest in Michigan last September, the old man saw that his last hope of escape had vanished—so he accepted the inevitable and bowed to the supremacy of the law. On returning to this city he promised to do all that man could do to right the wrongs he had committed. He confessed judgment of ouster in the two suits brought by the Commonwealth to annul the charters of the Eclectic Medical College of Pennsylvania and the American University of Philadelphia. He also gave a power of attorney to confess judgment of ouster for him against the Livingstone University of America, chartered by the State of West Virginia, which charter has been annulled by the Legislature of West Virginia. He has given up all the books he had—the matriculation books, the minutes of faculty, minutes of trustees, account books, alumni minutes—and a mass of valuable information, including a list of foreign diplomas sold and a catalogue of addresses including over 5000 names of persons who had corresponded with him. He gives the names of wholesale druggists in Philadelphia who have sold his diplomas, and he gives the names of the parties to whom the diplomas were issued. He relates how diplomas were signed by the faculty; how in one instance three professors, for $5 each, signed 500 diplomas for him, and how, for $3.50, which were to go abroad were certified to by a Spanish Consul. In all, about 10,000 names were tangled up in his disclosures. He has given the names of many professional abortionists, and the means whereby they destroy life. He tells of the tricks of his trade, the quack nostrums that are advertised to cure all diseases, and of the impostors who prey on public credulity. He tells of faith in the supernatural; of a fortune-teller in Philadelphia who reads destiny under the light of candles made of human fat. He relates how one doctor goes to Europe annually and brings back love-powders which he represented were compounded at the shrine of Cupid in Minerva's temple. He describes how one concern sells the pulverized gizzard of a chicken as a compound to produce artificial digestion. He recites incidents wherein he robbed graves, and how on one Saturday morning he stole five dead bodies from Blockley Almshouse. He tells how he kept himself clear of the Courts and their penalties. He tells of twenty-five concerns in this country and in Europe by which degrees are sold. He figures that fully 20,000 bogus diplomas are current in America, and 40,000 more in Europe. He gives the authorities a lever by which they can uproot every diploma dealer in America.

As a result of *The Record's* expose of Buchanan's business the charters of the American University of Philadelphia, the Eclectic Medical College of Pennsylvania, the Philadelphia University of Medicine and Surgery, and the Livingstone University of America (at Charleston, W. Va.) have been annulled, and bills have been introduced into the State Legislature to repeal the charters of the Quaker City Business College, the Pen Medical University, the Philadelphia Electropathic Institution, and the Philadelphia College of Medicine.

Buchanan states: 'Before I became connected with the Eclectic College, I was respected. I was a member of Nazareth M. E. Church. I had a good practice, and was making a little money. After I joined the accursed thing I never made a dollar. During the last ten years my practice gradually left me—really I was making nothing. I had a heavy load to carry. Bread and butter had to be provided for three houses. The college was a mere farce—a sort of free school. I have struggled for ten years as no other man struggled. Once in I saw my error. Sites and Hollemback got me in, and long have I struggled to get out. I can assign no reason for my conduct. Insanity? Certainly, every act, when I look at it, has been that of a crazed fool. When told to run I ran. When two hundred diplomas were wanted I ordered them to be printed. I lost all self reliance. When the two hundred diplomas were burned they told me to go away, and I went away. If I had followed the dictates of my own mind I never should have done it.'

Buchanan's experiences with the law have been marked with many ups and downs. Between his Legislative investigation of 1872, his numerous suits at law, three arrests and escapes, his final capture and suppression by *The Record*, he spent large sums. The law disturbed him, but in a way it brought a compensating return. Speaking of the condition of the diploma market at a particular period, Buchanan says: 'There was no demand for diplomas in those days, as the Legislature was quiet. Stir up a Medical bill, then there is a demand.' He further says: 'The Legislative investigation of 1872 cost me $3000, which I paid to committeemen. One of my charters was repealed. The other one was not disturbed.

As soon as the repeal was announced, in the month of March, 1872, I sent one of my professors, Henry C. Stickney, to a lawyer named Tener. I gave Stickney all the points, and gave him Chillion B. Allen's diploma, as it was the only one we had which was fully signed. I knew that Allen had gone to Vienna, so I made up an account of tuition, board, loss of time, damages, etc., and sent all to Tener, with instructions to retain another lawyer—one to sue, the other to defend. It was to cost $300 for both—$100 down, and $200 if they got it through all right. I told them to keep away from Sharswood, as he was

University man. The result was a decision by Judge Agnew in our favor. Paine had closed up in consequence of the Legislative repeal, but this decision put new life in him. He imagined the same would suit both parties, so he opened again; but I am sorry I did it.

In the abortion case of 1874 I paid $1250 to lawyers and $400 to my bail. The other cases were placed in the hands of a prominent lawyer, to whom I paid $250. Nothing more was heard of them until recently revived by Mr. Hagert.'

From Buchanan's confession and the books which accompany it is condensed what the Dean has to say about medical colleges:

Eclectic Medical College of Pennsylvania (*Philadelphia.*)—The minute books show that 'a meeting of the friends for the promotion of the science of medicine on the eclectic principle was held at No. 180 Vine Street on the 25th day of January, 1850.' This was the first entry made in the records of the institution. The sale of its diplomas dates back twenty-eight years, to 1853, and was continuously practiced from that date until the charter was annulled by the Courts six months ago. The faculty were cognizant of these doings. Their minutes show that they voted for and approved in many instances of the sale of their degrees. On the 15th of March, 1853, Dr. Simon Landis, of Ephrata, sent a letter announcing his intention of paying the full fees, $100, and submitting himself as a candidate for an illegal diploma. In 1863 appears the following:

> The secretary having received a letter from—— ——, of England, wishing to know the price of a diploma, it was ordered that he be informed by the secretary that the diploma would be forwarded for $50 in English money. Professor Holtemback having also received letters from Dr. Rich, of Canada, relative to conferring degrees on several gentlemen in that province, it was ordered that Professor Hollembaek be authorized to communicate with the doctor and arrange the prices, etc.

Buchanan became acquainted with its faculty in 1856, and when Paine left, in 1860, Buchanan commenced to lecture. He says: 'I knew very little of the workings of the concern. The first sale of diplomas of which I was cognizant was that effected by Dr. Hollembaek in Canada.'

In 1868. Buchanan started the American University of Philadelphia, which was intended for the medical education of colored men. The Dean says: 'The entire faculty were radical copperhead Democrats, and for a few months I was compelled to leave the Pine Street college, owing to my degradation in lecturing to a negro class. I had seventeen dead bodies in the cellar that I had gathered together and owned. I stopped dissecting at the college, and that brought Sites and Hollembaek to terms. They sold out to me for $1000, $600 of which was paid to Sites and $400 to Hollembaek.'

To protect the college from Legislative interference Buchanan says he paid $50 to each of the thirteen members of the Educational Committee of the State Legislature in 1871 and $3000 to the Legislative investigating committee of 1872.

The American University, (*Philadelphia*,) was chartered in 1867. 'William Clark, of Cape May Court House, and myself got up the charter. One-half of the incorporators were his friends, chosen by him, one half was mine. It was a half arrangement all through. The college was designed for the education of the colored man, patronage and financial aid being promised by Congressman William D. Kelley, Bishop Simpson and others. I wrote out the charter, and called one Sabbath morning at the house of a State legislator, who I thought would be an available man for my purposes. He told me he would secure the charter for me, and I think I gave him some money that day; at any rate the consideration was to be $100. The charter went through rapidly. Clark paid $200, his half of the expense. I remember this well, because when I bought Clark out afterward, and paid him $100, he told me he lost $100. The copy of the charter I have given you is the one the legislator gave to me. It seems he charged $7.50 for it besides. We opened the colored school at Tenth and Chestnut Streets with thirty-six students. Clark, Hutchins, Parden, Terry, Roberts, Cochran and myself comprised the faculty. We carried through successfully two full lecture courses. Rev. J. T. Goodrich, D. D., of the church at Eighth and Noble Streets, was President, and had the books of this colored class with him when he was burned to death in the great Chicago fire. Up to this time we had received no pecuniary help from those who had promised to aid us.

From the year 1870 every student of the Eclectic College received an American University diploma as well as the Eclectic, and when the National Eclectic Medical Association was formed, in January, 1870, each student got a diploma of that society also. This was done to please the students. They wanted more sail.

Fully 15,000 diplomas of this university are scattered over Europe. One man—Dr. Rumler—now in New York, tells me that he sold 10,000 of our diplomas in Germany for Sturnam. I have given you a list of 1600 names of persons who were registered by us between 1871 and 1874. These were in addition to the 10,000.'.

Livingstone University.—In regard to the Livingstone University of West Virginia, he says: 'There is a history attached to the stone on which the Livingstone diploma is now engraved. William Clark came to the college in 1863 as a lecturer on the Practice of Medicine. Having seen my diploma from Glasgow, he determined to have a copy of it, so he asked me to see a printer and have it copied, which was done. I think twenty-five copies were struck off. Clark got one, Cochran and Down also. I think Down paid a share of the engraving. Clark sold one to Dr. James Silverwright, of Chatham, Ontario. Then the stone was laid away in a cellar in a house in West Philadelphia. I subsequently bought the stone from Clark and had the Livingstone diploma engraved on it.

Professor Polk was in the office one day when Daniel Mayer, of West Virginia, arrived, saying he had got an order for 100 diplomas. Daniel was happy. Daniel Polk, Cochran, J. H. Brown and myself formed a circle of tables and signed all the diplomas.

At the college we sold some Livingstone diplomas for cash—not less than ten; it may be over twenty; several were given away to graduates, but none were sent to Europe by me. When Stickney left me in October, 1874, and went to Europe, I gave him fifty-three Livingstone diplomas; but never heard from him until 1876, when he returned and apologized. As I was rich then, I left him in full possession of the college, which he afterward robbed.'

Societies Controlled by Buchanan.—In addition to the three charters which Buchanan owned there were quite a number of adjunct concerns in which his control was supreme. He owned the diploma plates of the Alumni Society of the Eclectic Medical College of Pennsylvania, of the National Eclectic Medical Association, and of the Pennsylvania State Eclectic Society. Buchanan organized in Western New York the Middle State Eclectic Society, in opposition to Robert S. Newton, of the Eclectic College of New York. He organized a society in opposition to the Brooklyn Academy of Medicine, also a department of dentistry to his college, and the University College of Pharmacy. Buchanan also furnished diplomas to an English Graduation Board, which had 400 names on its lists. Buchanan also issued diplomas upon the recommendation of the Maine Eclectic Society, and upon the recommendation of the President of the Eclectic Society of Boston.

Philadelphia University of Medicine and Surgery.—Originally the Philadelphia University was the American College of Medicine, which was chartered by the Legislature in 1853. In 1865 the name was changed to the Philadelphia University of Medicine and Surgery, and in 1872 the charter was repealed by the Legislature for diploma selling. Buchanan says that after the legislative investigation Paine's books were by mistake sent to the Pine Street concern, and Buchanan on examining them footed up a total of $90,000 for the sale of diplomas. Dr. Blood, who sells out patent rights of States for 'oxygenized air,' and who recently figured in the Christiancy divorce case, sold, according to his statement to Buchanan, one thousand of Paine's diplomas. Blood also sold for Buchanan.

Penn Medical University.—'Four lecturers in that concern,' says Buchanan, 'were connected in some way with our Pine Street college. One of its professors sold one of our diplomas to a Cuban for $200. Another of its professors, Alexander E. E. Falken, is on our list of graduates, although I believe he never took his diploma. W. H. Blake, one of the faculty, is also one of our men.'

A Dental College.—'When Dr. MacMichael was leaving this city to return to Canada he called on Asay, the toothmaker on Race Street, above Tenth, and bought quite a large order of teeth, which he intended to take to Canada. With the teeth he had a roll of six or ten diplomas, which he told me were obtained from a dental college in Philadelphia, and were to be sold to dentists in Canada. I saw the diplomas.'

'Edward James Gregory, a dentist of Cheltenham, England, assures me that he purchased two dental degrees for two friends in England for $100 apiece from the college at Tenth and Arch Streets.'

Pittsburg and Bradford.—'Dr. Sprecher, of Pittsburg, runs an Electrical Institute,' says Buchanan; 'I sold him three diplomas.'

'To Dr. Ginner, of the Bradford School of Medicine, I sent four or five certificates of membership in the National Eclectic Medical Association. Dr. Greiner applied to me for a foreign degree.'

New York State Societies.—'All physicians in New York must either register their diplomas with the Clerk of the County Court or they must pass an examination before one of the three State societies—Allopathic, Homœopathic and Eclectic. These are organized in every county. These societies grant certificates to any one who applies for authority to practice. They are terrible bleeders. I have known them to ask $300 to put a man through. New York City is exempt from all this—the Board of Health is the power there.

Eclectic Medical of New York City.—When Dr. Thomas Airy, of Manchester, England, was here in 1874, he bought a diploma from Robert S. Newton, of the Eclectic Medical College of New York, for a child of 17 years. I saw the diploma. I was asked to make this sale, but refused.'

'In 1871 Bowlsby, Newton's man, brought Rosenwig, a Jew, over to our college and got a diploma from Sites for him. Bowlsby stated that Newton had one ready for him. In those schools it is the first diploma that they look at with suspicion. Once graduated you can buy without affecting the scruples of the most fastidious. Then the diplomas are called *ad eundems*.'

'Among my express receipts you will find a record of a package sent to Dr. Kordenat, of Honesdale, Pa. That package contained a renewal of Kordenat's old diploma and one for his student, E. R. Hayden ; Kordenat had been promising to send this young man down to our college. Ultimately he said he could not do it, and told us plainly that if we did not like to sell the diplomas, Newton would.'

'I told Mr. Manwarren, of Mexico, New York, that I would take his son free at the college, but the father waited and waited, till at last he wrote to tell me that he had an excellent location for his son and he would like a diploma for the boy. He said he gave me the first show because I had offered him so liberally before. Newton had been to see him, he said, and would do it.'

'J. Phinnell bought a diploma from Dr. Sites, and having lost it he had it renewed. He told me he bought one from Fields, Newton and others.'

'Dr. S. P. Munn, of Waterbury, Connecticut, bought a diploma from us, although he never attended. He was President of the National Eclectic Medical Association, which was started by Newton and Wilder a year or more after William Young, of Newburyport, Massachusetts. inaugurated the original National Eclectic Association.'

'Alexander Wilder, Secretary of the National Eclectic Medical Association, says: 'degrees both genuine and spurious have been notoriously a matter of traffic in this country for more than half a century, and I doubt now whether five colleges exist free from taint or imputation.'

United States of New York.—'This is a young concern, an offshoot from the Eclectics of New York. Before its organization the backers of this college offered to buy me out on Pine Street. There is one case in which I have personal knowledge of the sale of a diploma. They ask from $125 upward. I know that one of its officers offered to sell a diploma to N. W. Kinne, 32 West Jefferson Street, Syracuse, New York.'

Druid University.—'This concern is chartered by the State of New York, and extends all over the United States. Drs. Brown and Davies, of Athens, Maine, are owners of the charter, stone and seal. They adhere to Culpepper on Materia Medica. Davies was originally an Episcopal clergyman, but turned to medicine and took our diploma. The Druids are confined to the Welsh. The Druids implored me two years ago to abandon our State charter and begin under their auspices, but I was troubled with my head and would not go in. Last October a roll of their diplomas came to one of our students—Williams, of Maine. Somehow it got astray, and I traced it up for him. He told me what it was and whom they were intended for—parties who should not have such things. I asked him not to diliver till I wrote to Drs. Brown and Davies. It has been represented to me (I cannot vouch for it) that there is considerable money in this Druid affair. It is remarkable that the cactus grandiflorus, one of their remedies which operates on the heart, if given during the day causes suffocation and bleeding at the nose. If given when the sun sets it tranquilizes.'

Trall's Water Cure College.—'Trall's Water-cure College, at Florence, New Jersy, was chartered by New York State. I got quite a large number of students from Trall in 1868–'69–'70–'71, and we were quite friendly. Trall must have sold an unusual number of diplomas in England and America. I think Sturnam was his agent in England. In 1878 I received a letter from Sturnam, saying:

'I have also a number of Trall's diplomas and the right to grant them. I mean the Latin form—everything. Shall I send some? It has been hinted to me that Trall lately died. Now here's a chance for an old charter. Had you better not get it at once in another name or get some one to *secure* it? Write at once about this. I have his scholarship tickets—everything—and we could work the thing to pay us.

The charter, too, of the old Metropolitan College of New York could be had. Write fully.'

Western and Southern Institutions.—'A doctor named Mumey or Hodgkins, bolonging to one of the St. Louis Medical Colleges, a refugee, whom I met last August at the sulphur springs of Windsor, Canada, told me that in the past five years 3000 diplomas of the college of which he was a professor had been sold in the West. He gave me the address of a party on Walnut Street, Kansas City, where he had made a sale. In his baggage he had eleven foreign diplomas in blank.'

St. Louis Eclectic and American Eclectic.—'With the exception of Fields, the Dean of the St. Louis Eclectic Medical, I think all the professors in the American Eclectic and St. Louis Eclectic are our graduates. While I have not seen any of their sold diplomas, yet I received from Sturnam in 1878 this offer:

'Some time ago you applied for 500 St. Louis diplomas. I can get you them. Their diploma is ridiculous—all in English—and I advised a new kind in Latin (not like yours). It is possible I shall have the making of the diploma. I have the appointment as the London branch.'

Thrasher, one of the faculty of the American Eclectic, sent me the following list of names, stating that the Physio-Medical College of Cincinnatti (Nicely's) had sold a diploma to each, and I could do likewise, as they were not pleased with the Cincinnati sheepskins: George T. Dougherty, F. M. Richardson, G. T. Ragan. G. W. Albur, J. W. McCartney, L. H. Mason, J. Richardson, Sr,. all of Neoga, Cumberland County, Illinois.

George T. Dougherty's name appears also in the list of graduates from the college with which Thrasher is connected, and the second name on the list, F. M. Richardson, is marked in their announcement as Dougherty's preceptor. It would seem from this that Dougherty has the diplomas of the American Eclectic of St. Louis, the American Eclectic of Cincinnati and the Eclectic of Pennsylvania, two of which were certainly bought. Thrasher, who is one of the rising men in the diploma business, got up a Michigan directory of doctors. I gave him a diploma in consideration of an advertisement he gave us. When he was at Nicely's I sent him another for a student.

'Rev. George Sexton, of London, who was prominent in the British Medical Reform Association, to whom I sold diplomas in 1874, is a European agent of Fields'. Sexton commenced his career as a missionary, then became a lecturer for Kahn, and now is the agent for the Anthropological University of St. Louis.'

Anthropological University of St. Louis.—Fields, Sexton, Alford and Thrasher have an organization as perfect as the Catholic Church. They have penetrated every city of America and Great Britan with their agencies. The Eclectic is not popular and does not sell well, but the University of Anthropology goes off like hot cakes. I have understood I could buy 500 of its diplomas in bulk at any time. They deal largely. Alford and Sturnam have approached me, but I never answered their communications.

The Scotch ministers take to these university degrees like a set of hungry wolves. They will not investigate. They have the degree mania badly. Fully 20,000 diplomas of this University have been sold in Europe to ministers, doctors and teachers.

Buchanan was Secretary of the concern at its organization. Alford was a lecturer at Buchanan's college, and the American University then embraced the Anthropological University as its theological branch.

Cincinnati.—Buchanan says he bought a diploma last year from W. R. Nicely, Dean of the American Eclectic College of

Cincinnati, Ohio, and Dean of the "Physio-Eclectic" of the same city.

Boston.—Concerning the New England University he says: 'Henry C. Stickney, who runs the concern, told me he had sold thousands of these diplomas throughout Europe. They were worthless.'

Eclectic of Georgia.—The Eclectic Medical of Georgia was the only Eclectic College in the country which was recognized by Buchanan as in communion with his National Medical Association. According to the minutes I. J. M. Goss, of this college, got a diploma from the Pine Street college, on the 25th of May, 1857 for $25. Fishblatt, who is credited as a Professor of Dermatology in that institution, was, Buchanan says, in an arrangement with Professor Polk to sell Eclectic diplomas to W. B. Dyer and twelve others. Dyer's diploma was returned, Dyer paying the express charges. The price was to have been $50.

Keokuk, Iowa.—'I was offered the chair of surgery in the Eclectic College at Keokuk, Iowa' says Buchanan, 'and they frankly told me how they did business. They make no secret of it. They sell like a grocer's shop. There are several thousand of their diplomas out in the West!'

Detroit.—Dr. Buchanan says two-thirds of the physicians of Detroit hold bought diplomas. The Michigan Eclectic College is a latent concern, in which Buchanan holds stock. At its head is H. S. Thomas, who cavorted around Detroit with the old man after the alleged drowning occurred, and swore to false affidavits regarding Buchanan's whereabouts at the time of the suicide ruse. Chapman says that Thomas was prepared to prevent Buchanan's return to Philadelphia if the Dean had been captured in Detroit, and that the programme was to swear that this man was not Dr. Buchanan, but Thomas' father.

California.—'I sold a diploma in 1871 to J. H. Bundy, Professor of a California Medical College. He paid $60.'"

ARTICLE III.

Address to the Graduating Class of the Baltimore College of Dental Surgery. (Continued.)

DELIVERED BY REV. WILLIAM KIRKUS, M. A., LL. B.

It would almost certainly be impossible, it would perhaps be highly inexpedient, to attempt any such regulations as these in a country like the United States. Not only would it be impossible to secure uniform action through all the States of the Union, but there are here no ancient institutions commanding *universal* respect, like the English Universities and the great Medical Corporations, by which legislation might be guided. The advantages—without the drawbacks—of such legislative arrangements must be secured, among us, not by statute but by public opinion—and chiefly by the public opinion of the medical profession. And this is why I advise you never to forget that you are *physicians*. Never lower your profession either in your own persons or by encouraging low standards of medical education. In your own department of medical science and art, you occupy a position of very great advantage. Your college has a noble history and a high reputation. You need not be ashamed to be asked whence you come. Your predecessors have made a college which now can do very much toward making you. Not everything indeed—for one cannot "get a silk purse out of a sow's ear,"—but still very much. It will be for you to take care that you do not unmake your college—which were indeed a kind of parricide. There are colleges and there are colleges. When Bishop Tozer was in this country he was presented—so at least, I was gravely assured—with the diploma of Doctor of Divinity by what we should call in England a girls' school. I think he managed to evade accepting it. But take care that yours shall be not *a* college but *the* college of Dental Surgery in this broad new world. Show yourselves worthy of her. And use all your influence that her high standard of education shall be ever kept up to the topmost level of scientific research and mechanical skill.

I have urged upon you the importance of remembering that you are members of an illustrious and highly honoured profession. May I venture to warn you not to be over-professional, nor to presume too much upon the ignorance of the general public even about the subjects of which you have so large and so just a monopoly. As a professional man never works only for money, and will never be bribed at any price to do inferior work, so he will recognize that he is a public instructor. One of the greatest services that physicians have rendered to the world in modern times has come from their persistent endeavours to render their own services unnecessary. Think how much is implied in such advice as this—you don't want a doctor but a plumber. Don't take medicine,—filter and boil the water you drink, and buy milk for a while at some other dairy. Unexplained causes, obscure and unintelligible diseases, are a continual vexation to the true physician, as they are a godsend to the quack. What in the world would a third-rate doctor do without malaria? Everything can be laid on those broad shoulders. Unskilful treatment fails; not of course because it is unskilful, but because the case was somehow complicated with malaria. Diptheria again, is a perfectly well-defined disease—but the adjective diptheritic is still one of the most serviceable in the dictionary. It is just as easy to grow small-pox as to grow cabbage or to breed pigeons—indeed it is unfortunately much easier; but I have myself heard a doctor (not in America) talk of an eruption as if it were both small-pox and something else—or neither—a sort of cross between the two—just as if one were to talk of an animal that was not exactly a dog and not exactly a cat but a kind of dog-cat. You can no doubt rely upon a vast amount of the stupidest and most inexcusable ignorance. Thousands of people think their stomachs are in their chests; and that their food 'settles' in the lungs; and have the queerest possible notions about their livers and their nerves and their blood. It is this ignorance upon which quacks practice. I suppose we all receive by mail, about every three weeks some nasty pamphlet about all kinds of diseases—and about new and secret medicines which this way or that way will infallibly cure them. Such trash would never be printed if there were not multitudes of people scandalously ignorant of the most rudimentary truths upon which their own physical comfort and sometimes even their life depends. And ignorant people always delight in sweeping generalities. This is the secret of the success of recent revolutionary and, so to speak, heretical systems of medicines: which are disproved not so much by the arguments of their opponents as by the practice of their professors. It is found that their high-sounding generalities will not work—and the new system has to revert in almost all severe cases which really require a positive and active treatment, to the old remedies. I do not, of course, say that this is dishonest; but surely a rule which has as many exceptions as examples is just a little premature.

Nothing has given me a more exalted opinion of the high honour both of the legal and medical profession than the extreme rarity of cases in which they have abused their enormous powers. The majority of mankind are absolutely powerless in your hands—they will do whatever you command, they believe almost anything you say. The more serious a disease is, the longer may be your attendance; and therefore, both directly and indirectly, the higher your remuneration. You might naturally suppose, therefore, that invalids would try to make out that their ailments were trifling. But we all know that this is the exact opposite of the truth. Many people—especially "lovely woman"—resent being supposed common-place sufferers. Children habitually exaggerate the maladies of their parents and of their brothers and sisters. Who is so mean as to have a sore throat which is less than diptheritic?

What baby would be worth its bottle that had anything less than a diptheritic croup? Everybody's sickness is one of the very worst cases the doctor ever knew. And yet, with this heavy premium on quackery, with this intense longing on the part of many of your patients that you would "fool them to the top of their bent," it is the rarest thing in the world to find a doctor who will condescend to disgrace himself by taking advantage of this peculiar frailty. Keep up gentlemen, this part of the dignity of your profession—and do more than keep it up. Try to make it impossible, by spreading light all around. Put down humbug, wherever you find it. Don't let your patients make fools of themselves. Be on your guard even against the dignity of the doctor, as clergymen should be on their guard against the dignity of their cloth. I do not mean, of course, the true dignity which should characterize everybody whose ordinary occupation brings him into incessant contact with the most solemn realities of life. But beware of make-believe dignity—affected mannerism—airs of infallibility—pomposity—mystery—and always be on your guard against the one man or woman in a hundred who really could find you out if you made yourself absurd. Remember that *the literature* even of your own peculiar profession is the common property of every intelligent reader. We of the clergy are sometimes told that popular science has taken away our occupation—stripped off our sacred vestments of mystery—and reduced us to the shivering unsophistication of two legged featherless bipeds. Well! I have no quarrel with science, popular or profound. I reverence and love it, and I honour its professors. If it beats us off the ground we surely deserve to be beaten—for here, as in so many other cases, might is right. But remember that popular science must put you on your mettle. The Johns Hopkins University doesn't give scientific lectures away without results. You will have forever hereafter, a far more appreciative but also a far more critical community to deal with. People won't go on accepting mere phrases instead of wisdom; and pompous mysterious airs instead of skill. In your department of life, as in mine, we may take to heart Tom Hood's words in his far too unfamiliar "Ode to Rae Wilson."

"Mere verbiage! it is not worth a carrot!
Why Socrates or Plato, where's the odds?
Once taught a jay to supplicate the gods,
And made a Polly-theist of a parrot!"

But not only will you be genuinely dignified, earnest, thorough, enthusiastic in your profession, but you can scarcely fail, as physicians, to acquire a certain reverent seriousness' in the discharge of your duties and even in your ordinary behaviour and feeling. It is a very dreadful thing to stand so often between life and death; to grapple with that invisible foe, to whom sooner or later even your best skill must yield. No custom or familiarity, thank God, can ever so far brutralize you that you shall become indifferent to human suffering. Nor can you—least indeed of all men—fail to appreciate, if not the reasonableness, at any rate the immense power, of the religious emotions. I am told that a very large number of physicians are what people call infidels. If it be so—and I have no means of forming an accurate opinion—it would not I think be difficult to account for. But whatever your private opinion may be, you must constantly have to deal with people in those circumstances in which if they have any religion at all it is sure to make its appearance. It may be cowardly or heroic, it may be intelligent or superstitious, it may be soothing or exciting, it may stimulate or it may paralyse—but it will be there; and it will be there as a fact which no physician can dare to overlook. It will help or it may baffle all your skill. You cannot treat it with medicines; you cannot remove it by knife or cautery. You may say a wise word, you may check extravagance and reassure terror; but you will be able to do this only if you manifest at least an outward respect for the feelings which you may inwardly despise. And I would venture to suggest that you will greatly benefit, if not yourselves at least your patients, if you can be persuaded to accept the alliance of those very persons whom you may sometimes be tempted to regard as your most dangerous foes—I mean the Christian clergy. I know that they are sometimes exceedingly injudicious—that they excite patients whose very life depends upon absolute repose. They weary the almost exhausted powers by fervid exhortation or long prayers. They sometimes seem to forget that killing the body is not the most obviously best mode of saving a soul. Nevertheless they will do you more good than harm, and you will find very many of them most useful assistants. I imagine it is the rule with most thoughtful clergymen—as it is most assuredly my own—to regard with the utmost respect the wishes and directions of the physician. And I *know* that whatever you may think of their spiritual efficacy, prayers and sacraments are often among the safest and most effective anodynes. You leave orders that the priest shall be excluded from the chamber of the sick or dying—and you will probably be obeyed. But you forget that the fearful heart of your patient may be all the while, in an agony of distress from which no treatment of yours can set him free. It is not you who can lift off the load of his sins, or

> " With some sweet oblivious antidote
> Cleanse the stuff'd bosom of that perilous stuff
> Which weighs upon the heart."

Ridiculous as you may think it, we *have* a power which you do not possess: and not seldom, though without a miracle, the sacraments of the church—some solemn confession, some soothing absolution, some holy viaticum, has healed the sick and brought back a departing soul from the very grasp of death. Is it not better that we should work together as friends? For you ought not to forget that if you refuse this alliance we shall certainly work as enemies. You need not suppose that we should ever give up our work or consent to regard it as subordinate.

We recognize the body as sacred—as the temple of the Holy Ghost. We cherish life as a divine gift, and a solemn trust from which no power in the world can release us. We do not believe that the salvation of the soul need to interfere with, but on the contrary promotes, the healing of the body. But if the alternative should really arise—not only in the case of voluntary martyrdom but in the ordinary course of nature—that either body or spirit must be sacrificed, we should not hesitate a moment., For my own part I believe that what are called death-bed repentances, are, at the most, so excessivaly rare that they cannot form the basis of an argument for practical life. I should not tease away the life of a dying man. On the contrary I should trust him to God, and when he had passed away, I should pray for his soul. Moreover publicans and sinners may often be nearer to heaven than Scribes and Pharisees. But in the last result we hold, every one of us, that if and whenever a man's spirit can be saved from baseness and defilement only by means which may imperil his health—his health must be imperilled. You may call this superstition. I call it rational religion and common sense. But anyhow it is a fact, and no merely material force has ever been able, in a close fight, to overcome spiritual and immaterial forces.

And even before we arrive at cases of extreme danger of death, there are cases of difference of opinion and treatment between doctors and divines which, I think, merits your serious attention—I mean cases of nervous disturbance and threatened or incipient insanity. I entirely believe that injudicious religious treatment has driven many people mad; and that cases of this kind become almost epidemic during religious revivals, and that this is a very serious set-off from their advantages. But none the less am I sure the medical treatment of such cases is often highly injudicious. I arrive at this conclusion from careful observation during a ministerial experience of thirty years. I have known many persons whose minds were being unhinged by religious excitement, advised (not to seek calmer counsel from more judicious spiritual guides, but) to divert their attention entirely from religion—to give up attending church, Bible reading and prayer. Sometimes the advice has been followed, and the unhappy patient has been lost to religion altogether—has been induced to do an outrage to conscience and to abdicate the soverign glory of human nature forever. But other and contrary results are exceedingly numerous. Outraged conscience resumes its sway. The old sins come back with the additional burden of a cowardly and wilful apostasy. There is a physical and hopeless relapse; and the well-meaning physician has killed both body and soul. Surely such disasters might be prevented by a better understanding between the clergy and the medical profession.

And now, gentlemen, in the words of Holy Scripture, "I wish you good luck in the name of the Lord." Be strong and show yourselves men. Work hard. Keep abreast of all knowledge. Remember your college, your Professors, your profession. And then you are sure to succeed. Or if not ,you will at least have the inestimable consolation of having deserved to succeed.

ARTICLE VI.

Difficult Dentition.

BY EDWARD M. BUCKINGHAM, M. D.

Read before the Boston Society for Medical Observation, December 1, 1879.

The subject of the following paper was presented to me by my having the care of a case which, while in its main features not unusual, presented certain points of interest, one of which, I think, has not been much discussed, and another, though a matter on which every one has an opinion, depends for its understanding upon certain physiological facts, which I have not seen grouped together.

A boy of one year, having two teeth, and never having fully recovered his strength since being sick with cholera infantum, six months before, had been ill for some days. His diet was a thick mixture of Ridge's food and water, with an equal amount of milk. He had diarrhœa, meal and cheese being mixed with the fæces, vomiting and cough, for which examination of the chest gave no explanation. Milk and water, equal parts, were ordered, with the addition of an alkali. Ridge's food was omitted.

Second Day. No vomiting after the second meal, and diarrhœa ceased. Tympanitic abdomen and much rigidity of legs Fingers in mouth and swollen gum over the middle superior incisors. I cut the gum.

Third to eighth day. Skin of extremities red, shining, swollen and tender, but without fever. These appearances ended in a sharp line toward the trunk, advanced over the whole surface, faded without desquamation, and completed their course in three days. Once only, a little cheese in the dejections. Appetite improved, and in eight days he was well, but the teeth had not appeared.

Thirteen days later I learned that directions had been followed for two days only, during which time he was well; then the proportion of milk had been increased, and cheese had appeared in the fæces. In consequence the alkali had been abandoned and Ridge's food substituted. Matters not improving, milk had been repeatedly reduced, so that for two days the diet had been merely Ridge's food and water. During these days the dejections had been mostly meal, the child had been crying, and the fingers had become rigid. The same diet was ordered as before. He stopped crying on getting it, and had a comfortable night.

The next morning the gums were rather swollen, nowhere much so, and he was cross and restless. At midnight he began to breathe with a grunt, and early in the following morning the head was hot, fontanelle throbbing violently, pupils contracted and not reaching, lips livid, jaws set tight, and abdomen tympanitic; the gums were swollen, especially at the site of the old cut. He having been in a warm bath without effect, I again cut in the same place, but owing to the contraction of the jaw, or my own clumsiness, without hitting the tooth. There was more bleeding than usual. During the next fifteen minutes the child got his first sleep in twenty-four hours, and the fontanelle ceased throbbing. On waking at the end of that time, he received an injection, evacuating wind and a little fæces of good appearance. About noon, Dr. C. P. Putnam saw him with me, and made some incisions crossing mine. The pupils were then reacting much better than in the morning, but there were fever and rales in the chest. 6.30 P. M. Had taken food, and had a green dejection. Temperature higher; gums more generally swollen and red, and had bled repeatedly. I cut over four teeth of the lower jaw, and he was bathed and oiled. Three hours later, the temperature still rising, I cut two more teeth, thus completing the incisions where the swelling was marked, and he was again bathed. Rigidity continued and an hour after midnight he died.

An autopsy was made fifty-seven hours after death, Dr. Draper being present. The fontanelle was much sunken. The brain was very much injected: not much serum in the ventricles. No pathological changes. Kidneys and liver normal. Lungs engorged in lower lobes, but crepitating. Calvarium cartilaginous. Heart, bladder and intestines not examined.

Although the case is, excepting for the continued bleeding, by no means uncommon, it illustrates certain points in the treatment of children, notably, gum cutting, the use of starch and the difference in physiological age. Twice during my attendance the gums were cut. On the first occasion there seems to have been no effect, the improvement being remote, and after much trouble. On the second, the effect, though only temporary, seemed for the moment to be brilliant, the more or less comatose condition of several hours disappearing at once in sleep, the violent throbbing of the fontanelle diminishing from the first, and the pupils, which were greatly contracted and altogether irresponsive to light, being, when next examined, much better in both respects. It remains to be proved that the relief was consequent upon the incisions, but the connection was certainly interesting. That this one cut was not the only thing wanting is shown by the death, which may or may not have been owing, in part, to the delay in completing the incisions. It should be stated, however, that the swelling of the seat of the latter incisions was but slight until late in the day.

I have cut into swollen gums on twenty-one different occasions. Of course, this number is altogether too small to be regarded as affording anything more than a slight contribution to the study of the subject, and yet the study of these cases may not be without interest. Of them, one may, I think, be fairly subtracted, because the indications for it were not fairly marked, and the failure of what had been done as giving a bare chance of relief ought not to be compared with cases in which there was positive expectation of it.

Of the remaining twenty occasions, in one, the first incision in the reported case, the cut entirely failed. In one, the group of cuts on the last day of this patient's life, the incisions, at first promised well, finally utterly failed. The remaining eighteen were all followed rather closely by a certain amount of improvement.

In a few of these cases I have delayed cutting, hoping to reach the desired end by regulating diet, and this may somewhat alter the value of the statistics. It is, however, my impression that in those cases in which I have not been allowed to use the gum lancet, improvement has been less rapid. In another group of these eighteen cases, gum cutting has constituted the whole treatment, and in three at least of these last, the fretful child of the previous twenty-four hours has recovered its temper and spirits within an hour, and had an improved appetite for its next meal, or the next but one.

Two cases seem worthy of special mention. One, a little girl, still walking and speaking with difficulty, apparently remembering the relief given on a similar occasion with another tooth, asked me to cut her gum. That this was a request, and not an exclamation, was made clear by her coming toward me as she spoke. The other, whose gum I had cut at fourteen months, during the absence of his physician, who had afterward repeated the cut, came to his father, when suffering from a later tooth, with a knife from the dinner table, and a request for the operation. These two cases I allude to because in them the relief to suffering must have been considerable and immediate.

The case we have been considering has for its one unusual, not unique, feature bleeding from the gum, and the cause of this bleeding seems worth investigating. There was an unusually great, but by no means very great loss of blood at once, and during the afternoons the cut repeatedly oozed, though in the opinion of the nurse to no great extent. This had the effect, when I decided in the early evening to extend the cuts, to make me do it half at a time, in order that I might not have too great a bleeding surface to do with in case of accident, there being still two molar teeth over which I then thought the gum needed cutting, which was done a few hours later. Now the one positive thing shown by the autopsy was that the brain was overcharged with blood, and it has since suggested itself to me that anything that would have helped to restore the natural condition of things there, and anything that would have diminished the uneasiness in the gum, and so lesson the grinding, would have lessoned the probability of bleeding; that is, that there would have been less chance of bleeding had the incisions been finished at once. I offer this as a possible explanation of this case of bleeding, not of all cases, and to ask for criticism.

Then the question of the diet of this child is an interesting one. I hope we shall learn from some one present if teething never causes disturbance in nervous children who are properly fed and cared for. But it is certain that illfed children have the reputation of suffering most. Still we hear of so many children who eat all sorts of things and are well, that the question of starch digestion is interesting, and especially so in view of the fact that many children get it in small quantities as an adjunct to milk, and are reported as thriving. In consequence, I have searched for reports of experiments bearing on the subject.

Although the saliva, even of very young children, has been reported to have the power of turning starch into sugar, yet the food must be in contact with it but a very short time before passing into the stomach, and in the stomach of adults at least diastatic action seems to be hindered.

Prospero Sonsino, of Florence, found that the fresh infusion of the pancreas of five young sucklings, dogs, rabbits and a cat, had no diastatic action upon starch even after a long time, while the similar infusion made from adults transformed it almost immediately. He made similar experiments on the enteric juice, though with less satisfactory results, but some of them appeared to show him that the intestine transformed starch at an earlier age than the pancrease. Sonsino himself raises the question how far we may reason here from analogy.

Korowin, as the children's clinic at St. Petersburg, made examinations that, in connection with those of Sonsino, appear to be of more value than either alone, inasmuch as both reached somewhat the same result, the one through children who had died sick, the other through animals who had died well. Korowin tried to turn starch into sugar by means of the pancreas of children who died of different diseases, mostly of the chest and intestines, and who were examined at different periods after death. He found no diastatic action during the first month, a little during the second, enough for quantitative analysis at the end of the third, and the quality fully developed at the end of the first year. His report, which is valuable, would, I think, be more so if he had divided his intestinal and non-intestinal diseases into two groups.

I am indebted to the note-book of Dr. G. M. Garland for an account of examinations by Cr. Hans Wegschreider, who succeeded in converting starch into sugar by means of the fresh fæces of sucklings. He sometimes got a reaction in an hour, a strong one in twenty-four hours. These experiments agree with those of Sonsino on the infant intestine. The value, however, of Sonsino's experiments on the intestine is diminished by the observation of Pascentin, that the mucons membrane of other organs in dogs has diastatic power.

Besides these experiments in cooking starch in secretions and in infusions of organs, there remain those made directly upon the intestinal contents of young starch-fed children. In twelve autopsies made by M. Guillot, of children dead from different diseases, he found that both the small and the large intestine contained starch, as shown by a deep blue with tincture of iodine. I believe that there is a fuller account of these autopsies than I have been able to find, but that the children were quite young appears probable from their being quoted by Valleix in an article based on observations on the newly born. Zweifel examined the body of a seven days' child, born at term, and fed exclnsively on Nestle's *kindermehl.* The contents of the stomach were slimy and swollen, containing sugar and especially starch, which though its swelling had pressed the stomach out of place. The large intestine contained only unaltered starch. It would seem from this report that the child must have been liberally supplied with it, but it is to be observed that the remaining parts of the diet were disposed of. One analysis of the kindermehl shows sugar, fat, salts, etc., and thirty per cent. starch and dextrine. Other analyses give little starch.

Of course, in any experiments made at an autopsy, we are dealing with the organs of the sick, and it is always a fair question how much the sickness has altered the conditions. While we may have to wait a long time for the combination of a group of early autopsies in starch-fed babies, dead from violence, yet meanwhile we can examine the fæces of living children.

Prospero Sonsino made ten such examinations, as follows: (1.) Sick child of three months. Nestle's kindermehl. Starch shown in fæces by iodine and microscope. (2.) Enlargement of glands of neck, atrophy and diarrhœa at six months. Diet lactose. No starch in fæces. (3.) Well except for club-foot. Three months. Lactose. Strong blue color with iodine. (4.) Condition not stated. Fifteen months. Beef tea and lactose. No starch in fæces. (5.) Convalescent from pneumonia. Five years. Starchy food. A trace of starch in fæces. (6.) Empyma and rickets. Three years. Milk and starch. Fæces affords strong evidence of starch. (7.) Condition not stated. Three months. Mother's milk and bread. Fæces containing starch. (8.) Condition not stated. Twelve months. Milk and flour. No starch in fæces. (9.) Condition not stated. Age four and one half months. Groats, corn flour and milk. Starch abounds in fæces. (10.) Condition not stated. Ten months. Beef tea, yolk of egg, milk, and twice a day one teaspoon of arrowroot. Fæces contain a little starch.

It is interesting to notice that the pneumonia-convalescent and the patient with empyema and rickets did not digest all their starch, though far beyond the age at which Korowin's examinations would lead us to expect that they would: also that the ten months' child, health unknown, failed to dispose of two teaspoons of arrowroot, but a mixture of four different articles.

The most valuable cases of the series, as bearing on digestion under ordinary circumstances, are the five months' boy, well but for club-foot, who passed unaltered starch, and three children of twelve to sixteen months, of whom one at least was ill, who digested it.

During the past two weeks I have tried to repeat these experiments, but being unwilling to be the means of making your children eat starch, have but one case to report. This is a perfectly healthy boy of eleven months, having five teeth, and eating Indian and oat meal, bread, cracker and milk. I have repeatedly examined his fæces with iodine, always with a negative result.

It seems to me that in examining fæces for this purpose, either sick children should be rigorously rejected, or at least they should be arranged in a separate group. Such statistics, though less numerous, would be more valuable. It seems to be shown by this group of experiments that while there may be some question as to what is the earliest age at which starch is digested, it certainly is, in some children, in very small amount before the third month, and that as a rule children cannot digest it before the second year, perhaps later, to the same extent that adults can. These results seem to be reached most definitely by the experiments of Korowin. We may get still more definite ideas with increased knowledge of the infant intestine. The examination of recent infant fæces seems also a promising field of inquiry. But we can never arrive at exact results owing to what has been called "the difference of physiological age" in children at the same period after birth,—a difference perfectly well recognized. Compare, for instance, the case with which this paper was begun; a year old child, with two teeth, who passed Ridge's food unaltered through the bowels, with the other boy of eleven months, who had five teeth, and whose fæces gave no reaction with iodine, in spite of bread cracker and meal. It is well known that many physicians are in the habit of ordering starch in small quantity with milk, and getting good results, and it has been shown by Dr. Putnam that starch so given may make more digestible without being itself digested. It seems to be desirable, where this practice is followed, to have it thoroughly understood by the attendants that they are dealing, not with a food, but a drug, and a powerful drug, in order to hinder such abuse from ignorance as in the reported case in which starch was not recommended at all.—*Bost. Med. and Surg. Journal.*

EDITORIAL, ETC.

Advances and Retrogression in Medical Teaching.—Bellevue Hospital Medical College.—Bellevue Medical College, New York, lately made an advance movement in education, which it seems was a failure, or at least the Faculty saw fit lately to recede from this position and fall back on the simple qualification, as the only one demanded of students, of a desire to become a physician, and of possession of the necessary fee to pave the way to a realization of this desire. The advance made by Bellevue College was that "the Faculty for the session of 1880–81, adopted the following innovations, namely: 'Matriculation Examination' The matriculation examination will consist of English composition (one foolscap page of original composition upon any subject in the hand writing of the candidate,) grammar, an examination upon the above-mentioned composition; arithmetic, including vulgar and decimal fractions; algebra, including simple equations; geometry, first two books of Euclid. This examination will be waived for those who have received the degree of A. B., those who have passed the freshman examination for entrance into any incorporated literary college; those who present certificates of proficiency in the subjects of the matriculation examination from the principal or teachers of any regular high school; and those who have passed a matriculation examination at any recognized medical college or scientific school or academy in which an examination is required for admission.

The other change was to make a three years' course, instead of two, as formerly, a *sine qua non* for graduation."

The result of this change was that the attendance of students on Bellevue College fell off one-half, and the Faculty, seeing their decimated classes, felt that (we copy from the *Medical Gazette*) "this forces the solution of the question whether a body of medical teachers can, in justice to themselves and their school, afford to continue in operation a policy in which the profession, upon whose recomendations they are dependent for students, do not uphold and support them?

The Bellevue College authorities have decided this question in the negative, and evidently do not propose to offer themselves as a sacrifice on the altar of medical progress."

Evidently these gentlemen have no idea of seeing their school closed for lack of patronage, on account of advanced ideas respecting the previous qualifications of students who may wish to pursue a course of study in such an institution of learning. That such training would amazingly facilitate the labors of a corp of teachers no one can doubt; but if, as they say, those who send students to them do not recognize the need for any advance, it is hardly possible for a college, unless it be an endowed institution, to put a higher standard than is required by the public. In point of fact—and it is what we have always contended for,—the colleges are what the public make them. Get behind the curtain of faculty deliberations, where the graduating of a doubtful man is under discussion, and the question "what will be said by our friends in his neighborhood if we turn out such a man," must and will enter into the discussion. There is no avoiding it. Let the profession at large demand at the hands of the colleges a higher standard of education, under penalty of withdrawal of patronage, and the colleges will not be slow to respond; for "the colleges must be managed on business principles," and this would be no less one of them than is the acceptance of such students as now come, regardless of qualification. What was said by the writer in past years, reflecting the views of a distinguished thinker, is still true, that after all the average doctor of medicine or average dentist is as good as the public taste requires; and the best way to reform these professions is for those upon whom they practice to be well posted as to the qualifications necessary for them.

We copy from a late daily paper the following, which, however erroneous in view, shows the drift of public opinion:

"The medical society of Bangor recently expelled one of its members, a physician in good standing, on the ground that he had been guilty of the professional indiscretion of advertising his business. Had the erring brother been able to wheedle the local editors of Bangor into making complimentary mention of his professional skill, without charge, there would probably have been no trouble; but, having committed the unpardonable offence of having paid for the publication of a business announcement, in which he and the public were alike interested, he had to go. The dignity of the profession could not tolerate an impropriety at once so shocking in itself and so dangerous as a precedent.

The doctors of Bangor, and of the rest of the country as well, ought to know that this sort of thing is unworthy of themselves and of the age in which they live. They can no longer occupy that relation to the rest of the world which their guild sustained to it during medieval times, when learning and general intelligence were far less common than they are now, and which only the 'medicine men' sustain to the other members of the savage tribes of to-day. The time for such assumed superiority and exclusiveness has long since gone by. The world is moving, and the medical profession cannot afford to stand still. There is nothing sacred about it,—nothing that can exempt it from the operation of the same laws which apply to other honorable pursuits in life. The physician of the future must come out of that time-worn and cracked shell of 'professional dignity' upon which his predecessor laid so much stress, and stand the test of publicity and compitition, as is done by architects, lawyers, engineers, and the members of equally learned and honorable professions. If a doctor possesses special skill or knowledge in any particular branch of his profession, it is alike due to him and to the rest of the world that that fact should be publicly known; and if the medical societies forever undertake to obstruct the course of a law of life so natural and so just they will find the confidence and the patronage they have so long enjoyed rapidly and surely passing to other hands.

H.

Wanted.—The following numbers of the AMERICAN JOURNAL OF DENTAL SCIENCE. Any one having them or any of them, will confer a great favor on the writer by sending them to

Snowden & Cowman's Dental Depot. Twenty-five cents each will be paid. Vol. V., No. 12. Vol. VI., No. 2. Vol. VI., No. 7. Vol. XI. No. 11.

JAMES B. HODGKIN.

BIBLIOGRAPHICAL.

Elementary Treatise on Practical Chemistry, and Qualitative Inorganic Analysis. Adapted for Laboratories of Colleges, Schools and Beginners. By Frank Clowes, C. Sc., London, 370 pages. Philadelphia, Henry C. Lea's Sons & Co. 1881.

This is a working book, intended for the use of those who have been made familiar with the nomenclature and foundation work of chemical science, and presupposes a knowledge of the first principles. To those who propose to do laboratory chemistry—and there is really no other way of learning it,—such a book is valuable as containing sufficiently minute directions as to manipulation, &c. The key-note of the book is had in the words we copy from page 86 on the method of trying the chemical analytical reactions: "The student must consider it a necessary condition of after success that each result is obtained precisely as stated in the text, and must never on any account pass on until he has conscientiously satisfied himself that the statements of the book are true, and that he could at any time repeat the text successfully." The number of text books of chemistry issuing from time to time indicates a demand for such literature, and that the number of students is augmenting. With this book much may be learned of manipulation, (which is *real* knowledge) as against simple theory (which is *ideal* knowledge only.) If our dental students would take such books as this and perform a few experiments for themselves, they would acquire a practical knowledge of chemistry which would make the chemical lectures less tedious and more lucid.

H.

Essentials of Chemistry.—Organic and inorganic. For the use of students in medicine. By R. A. Witthaus, A.M., M. D. Prof. of Chemistry University of Vermont. Wm. Wood & Co., New York. 1880.

A pocket volume of about 250 pages, neatly arranged with concise questions and answers. The author has condensed a great deal of information into a little space, and for a reference book this is an excellent one indeed. It is not a manual of analytical chemistry, and contains "only such analytical process as the physician may reasonably expect to make use of in his daily practice." Physiological chemistry occupies a respectable space, and the modern system of notation is adopted. The weights and measures are given in the metric system, and temperatures in the centigrade scale. As a handy reference book we feel sure it will find a welcome. H.

MONTHLY SUMMARY.

Bleaching Gutta Percha.—Dissolve the gutta percha in twenty times its weight of boiling benzole, add to the solution plaster of very good quality, and agitate the mixture from time to time. By reposing for two days the plaster is deposited and carries down with it all the impurities of the gutta percha insoluble in benzole. The clear liquid decanted is introduced by small portions at a time into twice its volume of alcohol 90 per cent., agitating continually. During this operation the gutta percha is precipitated in the state of a pasty mass, perfectly white. The nesiccation of the gutta percha, thus purified, requires several weeks' exposure to the air, but may be accelerated by trituration in a mortar, which liberate moistures which it tends to retain.—*Druggists Circular.*

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RULES AND REGULATIONS OF THE LIBRARY

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